

COMPUTERWORLD

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AT&T bids for broader T1 appeal

BY ELISABETH HORWITT
CW STAFF

BASKING RIDGE, N.J. — AT&T's latest addition to its Accunet service family could make high-speed digital leased lines cost-justifiable to smaller companies and multisite firms for the first time. But regional carriers must follow suit with similar offerings.

Accunet Spectrum of Digital Services supports 56K bit/sec. speeds at less than one-fourth the cost of AT&T's existing Dataphone Digital Service, AT&T said.

The new services, announced last week, will also allow users to use and pay for whatever fraction of a T1 link best suits their networking needs. The services offer intermediate bit rates of 128K, 256K, 384K, 512K and 768K bit/sec., AT&T said.

This fractional T1 feature targets users whose high-speed networking applications and traffic levels require multiple 64K bit/sec. DSO channels but

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Workstation price war raging

BY JULIE PITTA
and WILLIAM BRANDEL
CW STAFF

Workstation manufacturers are waging a price war that rivals any other battle in the computer industry.

Looking to buy market share, companies such as Data General Corp. and Digital Equipment Corp. have introduced Unix-based workstations at eye-catching prices during the first half of this year. Even Sun Microsystems, Inc. — the leader in the workstation market until Hewlett-Packard Co. and Apollo Computer, Inc. recently agreed to join forces — has felt compelled to keep pace.

How competitive is it? "There's a big difference between what you could get for \$10,000 last year vs. this year," said David Burdick, a vice-president at Dataquest, Inc. in San Jose, Calif. "For \$10,000 last year, you got a 4-MIPS machine with 8M bytes of RAM. This year, you get a 10- to 12-MIPS box with 8M bytes of RAM."

Fortunate Sun

Industry watchers say these vendors are suffering from squeezed margins. "Sun is the lucky one," said Peter Rogers,

Then ... and now

Even within Sun's own product line, price/performance has improved dramatically in just 21 months

	Sun-4/200	Sparcstation 1
• Introduction date	July 1987	April 1989
• MIPS	10	12.5
• Main memory	8M bytes	8M bytes
• Disk storage	280M bytes	208M bytes
• Price	\$39,900	\$12,995

SOURCE: SUN MICROSYSTEMS, INC.

CW CHART: JOHN YORK

an industry analyst at Robertson & Stephens in San Francisco. "They've led the way in RISC, in Unix, and they've been the market-share leader. Everyone else has to discount products to compensate."

Even Sun is feeling a pinch, Rogers said. "Sun's been willing to do 10% operating margins to gain market share," he maintained. "That's below the industry average. I'd say there's some pain there."

Austin Mayer, Sun's director of investor relations, confirmed that operating margins over the last four quarters are 10.1%. "We want to do 10% as a mini-

mum," Mayer said. "Acceptable for us is in the 10% to 15% range."

A minicomputer vendor such as DEC has a cushion in this regard. Sales from its VAX systems can make up for reduced margins on the low end of its line. A base configuration of its Decstation 3100 — a Unix-based workstation offering 14 million instructions per second of performance — sells for \$11,900.

DEC is willing to discount workstations "because they feel the desktop is strategically important to their overall business," Rogers said. DEC is re-

Continued on page 4

Raid! Companies turn to hired guns to test security

BY MICHAEL ALEXANDER
CW STAFF



TOM MONAHAN

The security guard chose the wrong time to go to the rest room. In the brief period that he stepped away from guarding the entrance of the data center building of an East Coast utility, a "tiger team" slipped into the building and began prowling the halls in search of other security lapses. In less than an hour, the security firm that had hired the guard was out of a job and guards from another company had been put into position.

Tiger teams — made up of computer security experts who conduct commando-style raids on data centers to expose security loopholes — are in vogue, mainly because of widespread publicity stemming from hacker attacks and other computer-related crimes.

Though hard data is unavailable, several security analysts said that the majority of the nation's largest companies, especially those in the Fortune 100, have used tiger teams to test their computer security in the past year.

Senior management, the board of directors or corporate auditors usually hire the teams to probe for weaknesses in security procedures and to verify that the IS department's assurances about systems security are indeed accurate.

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DBMS market shuffle

Survey sees IS buyers weighing more PC options

BY DOUGLAS BARNEY
CW STAFF

TORRANCE, Calif. — The personal computer database management system market currently dominated by Ashton-Tate Corp. will change markedly in the next two years, according to an exclusive *Computerworld* survey of nearly 200 MIS professionals.

The advent of SQL on microcomputers and a big push from Ashton-Tate competitors such as Borland International are re-

shuffling the database deck. Despite the broadening array of good DBMS choices, however, Ashton-Tate's dBase is expected to retain a dominant share.

The market is clearly separating into two hotly contested camps. The front-end camp consists of off-the-shelf packages such as dBase, Borland's Paradox, Dataease International, Inc.'s Dataease and customized front ends built with a variety of programming tools.

The back-end or server market will be dominated by IBM's OS/2 Extended Edition, the Ashton-Tate/Microsoft Corp./Sybase, Inc. SQL Server, Oracle Corp.'s Oracle and Gupta Technologies, Inc.'s SQLbase, in that order, the survey found.

Edward E. Taylor III is currently considering a host of SQL back ends, including SQL Serv-

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NEWSPAPER

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Quotable

"The trouble is, when customers wait and see how you do, you don't do as well."

ROBERT K. WEILER
CULLINET

On the effect Cullinet's financial troubles have had on sales—or vice versa. See story page 145.

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EXECUTIVE BRIEFING

■ **Tiger teams are prowling data centers** in top corporations, and not everyone is happy with what they are finding. The teams, made up of security experts who conduct commando-style raids on data centers to expose security loopholes, are being brought in by top management to test computer security. Widespread publicity stemming from hacker attacks and other computer-related crimes is spurring the use of these controversial teams. **Page 1.**

■ **The average multivendor network** is incompatible and difficult to control, so the idea of folding multiple management systems into one single package holds great appeal for some users. But many organizations have spent years developing separate, nonintegrated systems, and they like their management structures as they are. **Page 85.**

■ **The insurance industry emerges** from a period of downsizing and mergers. Firms are hiring but doing so selectively. As a result, middle managers and professionals with marginal skills may find the job hunt tough going. **Page 124.**

■ **The U.S. Environmental Protection Agency is exploring EDI** as a way for regulated companies to submit their mandated reports electronically. Electronically filing the myriad reports that government agencies require is becoming more popular. A recent survey showed that 68 federal agencies have electronic filing programs, and many are adopting EDI to exchange forms with industry. **Page 64.**

■ **Ashton-Tate's vise-like grip** on the PC DBMS market is likely to loosen dramatically during the next two years as the advent of SQL on micros and a strong drive from Borland International and other competitors takes market share away. **Page 1.**

■ **Nowhere is the incompatibility problem** more evident than in the not-so-cold war between Apple's Macintosh and MS-DOS-based PCs. Incompatibility has become so common that it is almost taken for granted that Apples and PCs simply do not mix. But this two-camp theory of personal computing is changing. Macintoshes and PCs are beginning to gain the ability to exchange data in some pretty exciting ways. **Page 109.**

■ **The obstacles to widespread use of OS/2** in corporate accounts are beginning

to disappear as such vendors as 3Com, Microsoft and Digital Research take aim at delivering OS/2-to-IBM Systems Network Architecture connectivity. Users who object to IBM's bundled approach of OS/2 Extended Edition are now finding they have at least a few choices. **Page 51.**

■ **Bankers Trust's \$1 million investment** in an imaging processing system is paying off quickly. The system now processes and reviews 150,000 mortgages for the bank's corporate trust and agency group. The FileNet imaging system is tied into the bank's IBM 3090 mainframe and is used to safeguard collateral and monitor due diligence of payments—an essential part of the division's business. "We wanted to get away from the process of physically handling and routing paper throughout the organization," the division's vice-president says. **Page 25.**

■ **Bankamerica's executive vice-president** of systems engineering is building flexible information systems that can be altered as the bank's course changes. Michael Simmons came to Bankamerica from the top IS post at Fidelity to find 2,000 projects on the MIS plate. He now oversees 4,200 employees with an annual budget of about \$500 million. **Page 84.**

■ **Simmons' predecessor** at Bankamerica, Louis H. Mertes, who oversaw that company's disastrous MasterNet project, has been named vice-president of data processing at Lincoln National Life Insurance. **Page 4.**

UPDATE

Anniversaries this (national crime) month: Fifteen years ago, a \$40 million IBM study revealed 90% of DP sites surveyed had woefully poor security. In 1978, burglars swiped 1,000 boards from Lehman College's IBM 360 mainframe. Five years ago, a study of 5,000 banks revealed widespread computer crime and abuse. And seven years ago, DEC entered the PC market with four ill-fated non-IBM-compatible machines.

Now that was criminal.



Building a link between Macintoshes and Personal Computers. **Page 109.**

A year after his return, Cullinane still confronts skeptics. **Page 145.**



ART: MARTY BRAUN
PHOTO: SETH KESNICK



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**COMPUTER
ASSOCIATES**
Software superior by design

IBM tailors new outfit for RT

BY WILLIAM BRANDEL
and PATRICK WAURZYNIAK
CW STAFF

IBM steadfastly refuses to pack in its workstations and instead will dramatically revamp and reposition its sagging RT line later this year, according to the vendor and other sources.

The RT will gain a new bus, two new graphical user interfaces — including one from Next, Inc. — a new optional operating system and Netview support, all in an attempt to lure a skeptical MIS community into the RT fold.

Software shortages and a restrictive proprietary design have crippled the RT's sales. IBM has sold fewer than 20,000 of the machines and has only 2% to 3% of the market, admitted William J. Filip, assistant general manager of IBM's Personal Systems Advanced Workstation Division. In contrast, smaller Sun Microsystems, Inc. has 127,000 systems installed, according to market research firm International Data Corp.

Topping the list of new features will be OSF/Motif, a graphical interface that mimics the look and feel of the more mainstream IBM and Microsoft Corp. OS/2 Presentation Manager.

With enough third-party support, this addition should help eliminate the nagging criticism that the RT does not have enough quality software.

Software developers currently writing for the Presentation Manager, such as Micrografix, Inc., are considering the move to Motif.

In the blender

IBM hopes to boost the RT by blending it with its Personal System/2 line. As part of that effort, the workstation will pick up a high-speed version of IBM's Micro Channel Architecture bus, the vendor confirmed. This enhancement will allow the RT to use the same cards as those developed for the PS/2 line.

As part of the blending effort, the low-end RT machines will be available in the compact PS/2 form, sources said.

In addition to OSF/Motif, due out this summer, IBM will offer Nextstep, an interface from Next, IBM confirmed. The firm will also offer as an option MachOS, a version of Unix designed at Carnegie-Mellon University in Pittsburgh and tailored for graphical systems.

One source briefed by IBM said the new RTs will run at 7 million floating-point operations

per second and 18 to 19 million instructions per second (MIPS), with an average price of about \$800 per MIPS. Estimated prices range from \$12,000 to \$25,000, the source said.

IBM's broad goal is to make the RT a more substantial member of the IBM family of products by adding more industry-standard features, such as the MCA bus, and OSF/Motif, analysts said. With luck, that may convince users that the RT is a more open machine, they said.

To soothe MIS networking fears, the new RTs can be managed with Netview, IBM's strategic network management system, which will allow the RT to operate more effectively as a network server.

Meeting needs

The planned enhancements address most items on the checklist of one longtime RT user.

"Their problems were never really with processing power. It was all with the software. They need to come up with some software that works, a more open at-

titude toward the box and an effective windowing system," said Lou Lipnick, a vice-president at Salomon Brothers, Inc., which uses RTs.

Others blamed the hardware design. "The basic RISC chip set was good; it just wasn't implemented aggressively enough in silicon. Also, there were problems with the architecture — there wasn't enough memory, no caching. Everything was wrong with it," said Robert Herwick, an analyst at Hambrecht & Quist, Inc.

While Herwick said he expects good floating-point performance demanded by IBM's commercial-side customers, he added, "IBM will never be the price/performance leader. They don't have to be."

The architectural changes to the RT are drastic enough to cause compatibility problems. On the reduced instruction set computing "follow-on," as it has been called at IBM, Filip said, "It's not object-code-compatible; you have to do a recompile."

West Coast Bureau Chief
Jean S. Bozman, West Coast Correspondent
Julie Pitta and Senior Editor Douglas Barney contributed to this report.

Price war

FROM PAGE 1

portedly selling the Decstation 3100 at significantly less than list price to keep pace in the price-sensitive market.

"It's a very competitive market, and our goal is to win the desktop," said a DEC spokesman who declined to comment on any discounts the company is offering. "But we're not giving things away."

"Price-cutting is the law of this technology," he continued. "How far are prices going to drop? I don't think anyone can answer that."

Struggling DG is not so lucky. Sluggish sales for its other products are not likely to compensate for thin margins on its new Avion workstation. Avion, a Unix workstation running at 17 MIPS, is priced at an eye-popping \$7,450.

Many in the industry are calling the Avion DG's last-gasp attempt to gain market share. Some have ventured that DG will make little if any money on the machine, a contention that DG officials deny.

"Data General is in survival mode," said Robert Herwick, industry analyst at Hambrecht & Quist, Inc. in San Francisco. "For all these companies, it's a volume game and a market-share game. These vendors are looking more at return on assets than profit margins."

Sandy Friedman, manager of DG's workstation marketing, said the company's automated production plant allows it to build

the Avion cheaply and maintain reasonable margins. However, he added that companies such as DG are willing to make less on a desktop system in the hopes of persuading a customer to buy an entire package — workstations, minicomputers, communications

IT'S A VERY competitive market, and our goal is to win the desktop. But we're not giving things away."

A DEC SPOKESMAN

products and service.

"The workstation is a loss leader," Friedman admitted. "We would give it away if the customer would buy our solution."

If there is any winner in this pricing battle, it is the customer. "If memory does get really cheap, it would allow the masses to get to the power platforms," said Jack Baumann, end-user computing manager at Hughes Aircraft Co. in Long Beach, Calif. "We would be able to go down a road we haven't before."

Frank Smith, a systems integrator at Lockheed Missiles & Space in Sunnyvale, Calif., said, "I can envision three-dimensional, real-time models on a workstation. That kind of thing takes lots of memory resident on the machine. It would allow our engineers to determine air flow on a plane in real time."

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Former Bankamerica chief named VP at Lincoln Life

BY CLINTON WILDER
CW STAFF

FORT WAYNE, Ind. — Louis H. Mertes, the former Bankamerica Corp. information systems chief who oversaw that firm's disastrous Masternet project, has been named vice-president of data processing at Lincoln National Life Insurance Co.

Mertes, 50, begins his new job today. He reports to David D. Allen, executive vice-president of technology and staff services.

Mertes led Bankamerica's systems engineering unit from late 1985 until October 1987. He resigned amid speculation that his departure was connected with Masternet, an on-line institutional trust accounting system [CW, Oct. 26, 1987]. Bankamerica abandoned the project last year after spending an estimated \$80 million [CW, Feb. 1, 1988].

Mertes, who replaced American Airlines Sabre pioneer Max D. Hopper at Bankamerica, was succeeded there last summer by Michael Simmons, formerly at Fidelity Investments, Inc. Simmons, in his first 10 months at Bankamerica, is concentrating on integrating networks and in-

stalling intelligent workstations (see story page 84).

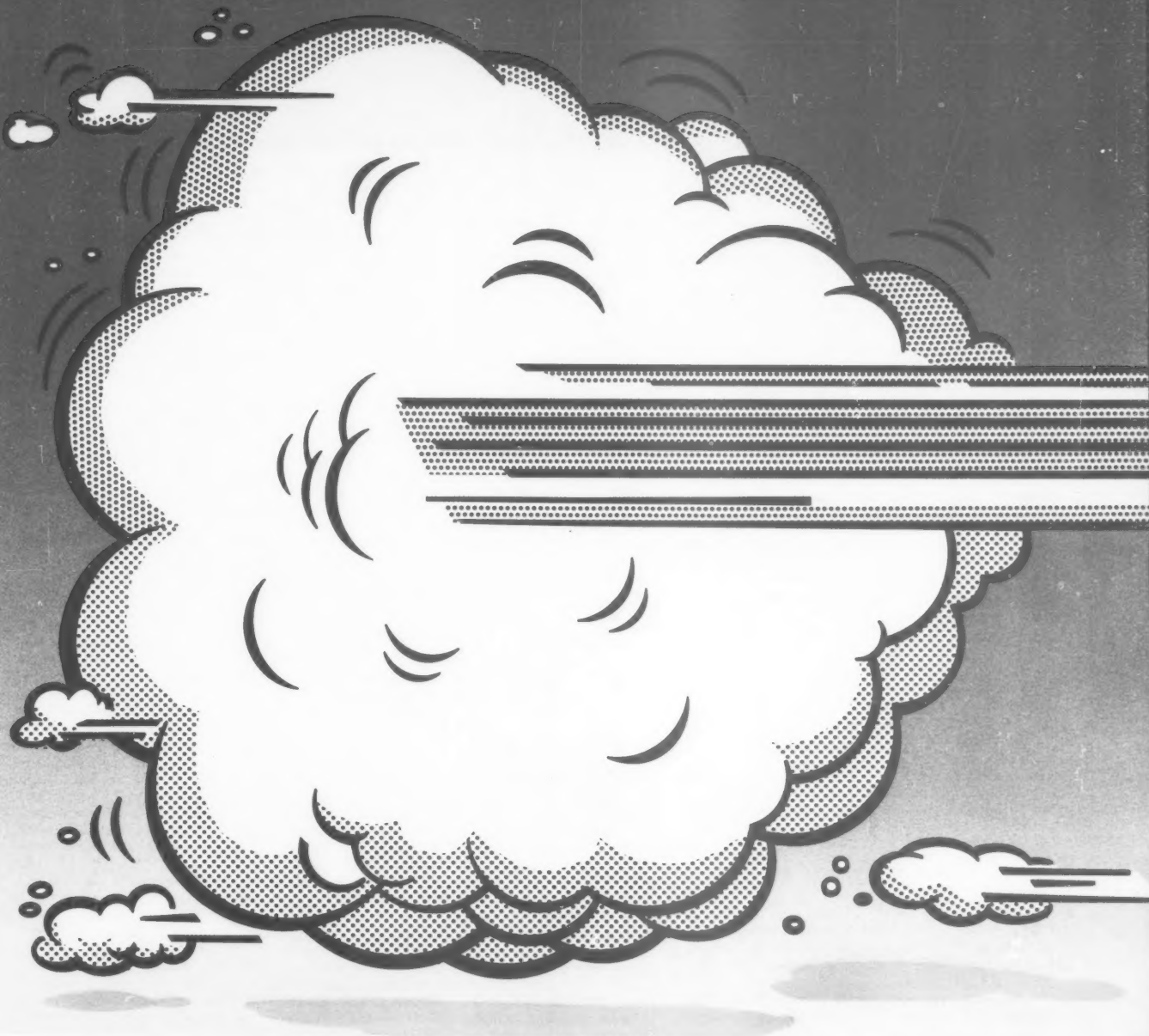
Mertes, a native of the Chicago area, joined Bankamerica from one of its subsidiaries, Seattle-based Seafirst Corp. Ironically, Bankamerica shifted most of the trust account processing



Mertes left Bankamerica after Masternet project failed

planned for Masternet to Seafirst's IS organization last year.

Lincoln National Life is the largest unit of Lincoln National Corp., a \$6 billion, 10,000-employee diversified financial services firm based here. It collects about \$2 billion annually in premiums.



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NEWS SHORTS

Racal acquires Interlan

Interlan, Inc. in Buxboro, Mass., last week became the latest supplier to accede to the consolidation craze in the communications industry. Racal Corp., a communications equipment supplier and subsidiary of UK-based Racal Electronics Ltd., said it has signed an agreement to acquire Interlan for approximately \$57 million. Interlan, currently owned by Micom Systems, Inc., will be known as Racal Interlan and be part of Racal's Data Communications Operations providing Ethernet applications.

DEC to sell Olivetti PCs in Europe

Digital Equipment Corp. and Ing. C. Olivetti & Co. have signed a contract under which Olivetti will provide DEC with personal computers for European distribution under its Decstation PC line. The systems, based on Intel Corp. 80286, 80386 and 80386SX chips, will be manufactured to DEC's specifications at Olivetti's Italian facilities and marketed and serviced by DEC sales and service groups. Olivetti will be the second company to make PCs for DEC. Tandy PCs are sold in the U.S. under the DEC label.

Wyse bites on IBM patent offer

IBM and Wyse Technology teamed up last week to sign a patent licensing agreement that allows Wyse to use IBM patents for five years. Wyse will pay royalty fees of 3% to 5% of sales on products using IBM patents. The amount will be determined by the number and nature of patents used, Wyse said.

China cited for copyright violations

China tops the list of 12 countries named by the International Intellectual Property Alliance as the leading nations in copyright pirating, followed by Saudi Arabia and South Korea. According to the organization, annual sales losses to U.S. companies caused by the pirating of computer software, films, music and books totaled \$1.3 billion. China's portion totaled \$418 million.

Bill aims to set Bells free

U.S. Reps. Al Swift (D-Wash.) and Thomas J. Tauke (R-Iowa) introduced a bill last week to ease the court-ordered restrictions on the regional holding companies and allow them to enter the information services and manufacturing markets. The bill, aimed at restoring congressional control over telecommunications policy, faces months of hearings and negotiations.

Dialcom will hook E-mail to X.400

Dialcom, Inc., a Rockville, Md.-based electronic mail vendor, announced an agreement with MCI Communications Corp. last week to provide commercial interconnection of their E-mail services using the X.400 standard.

Leisure-wear for Sabre system

Leisure activities in 48 countries, from polo to spelunking to hot-air ballooning, are available on a new database being sold by American Airlines' Sabre Travel Information Network and Applied Information Services, Inc. The database of more than 85,000 leisure travel opportunities, called the Sabre Official Recreation Guide, features a menu-driven format and is available for travel agents who use Sabre.

Defense saps Prime earnings

Prime Computer, Inc. now has five million additional reasons to resent MAI Basic Four, Inc.'s hostile takeover offensive. The \$5 million net loss that Prime reported last week for its first quarter included a \$6.3 million pretax bill for expenses relating to the spurned bid, the firm said. What's more, a Prime spokesman said, the company's underwhelming 6% revenue rise to \$387 million in part reflects purchases that have been deferred because of qualms about the proposed acquisition. The costs of organizational changes, layoffs and two recent acquisitions by Prime were also cited as affecting first-quarter results.

Flippable card muffles bus debate

BY PATRICIA KEEFE
ON STAFF

BOSTON — As expected, Digital Communications Associates, Inc. (DCA) last week unwrapped a 3270 emulation card that is compatible with both IBM's Personal Computer AT bus and Micro Channel Architecture (MCA). Early users praised the board's design and convenience.

IBM compatibility is a must for adoption, and having one card that fits two machines will take some of the worry out of migration strategies, they said.

"You're absolutely talking better discounts and better bookkeeping with one card that does both," said Larry Smith, a

senior systems programmer with a California-based utility that is beta-testing the card.

There is a patent pending on the technology, and DCA executives said they are uncertain whether the company will offer licenses to other vendors.

The technology does not lend itself to all add-in cards — for example, memory and random-access memory-extender cards, according to Andrew Seybold, president of Computer Insider, Inc. Likely candidates for adoption, in addition to 3270 emulation, include graphics and modem board makers.

Priced at \$695, Irma 3 is a flippable card that comes with removable hardware specific to

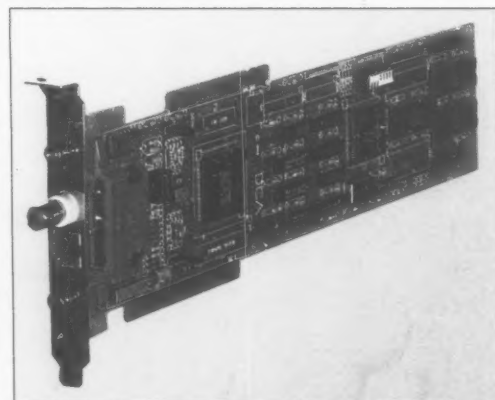
each bus connection and can be converted in less than five minutes using a screwdriver.

Users who have tested this latest generation Irma card verified that it is fully MCA-compatible and offers comparable performance in both PCs and IBM Personal System/2s.

"We tested it in both types of machines with the same configuration [memory, hard drive capacity, speed] and detected virtually no performance differences," said Lynn Parsons, a spokesman for Compaq Computer Corp., which uses Irma products internally and is an Extended Industry Standard Architecture supporter. Compaq ran those tests using OS/2 Extended Edition Version 1.1.

Custom communications processing chips make Irma 3 compatible with the following IBM software: OS/2 Extended's Communications Manager, 3270 Workstation Program, PC 3270 Emulation Program Version 3.0, PC 3270 Emulation Program Entry-Level and Enhanced Connectivity Facility. Irma 3 also supports coaxial and twisted-pair cable, DCA said.

Support of IBM's communications programs could help DCA gain back some 3270 ground lost to IBM. Smith said his organization is mostly standardized on Irma, but with the advent of OS/2 and the Communications Manager, he was forced to use IBM's 3270 board.



DCA's Irma 3 can flip to support AT or MCA bus architectures

AT&T

FROM PAGE 1

cannot justify full 1.5M bit/sec. T1 links, according to Woody Kerkeslager, AT&T director of business services.

"Fractional T1 is a very popular notion — it makes the benefits of T1 available to smaller users," said Thomas Nolle, president of CIMI Corp., a consulting firm in Haddonfield, N.J. But small users will still be priced out of the T1 market if regional carriers do not extend fractional T1 over the local loop, he added.

Several companies expressed a keen interest in fractional T1 services — particularly now that major T1 switch vendors such as Network Equipment Technologies, Inc. (NET) and Timeplex, Inc. have announced products that support such offerings.

"We are looking at fractional T1 very closely, since we are in the process of reducing the size of our network," said Ian Azrikan, senior communications planner at Drexel Burnham Lambert, Inc. AT&T is one of several bidders for Drexel's contract, Azrikan said.

Sears Technology Services, Inc., a major NET installation, has been waiting for carriers

such as AT&T to introduce a fractional T1 service so that it can provide service to sites that now have multiple 56K bit/sec. Dataphone Digital Service connections, a spokesman said.

Mervyn's, which has been considering bids from several

as a way to get smaller companies and sites to buy their high-speed services, Nolle said.

Regional carriers must also provide Spectrum-like offerings for users to fully realize the other cost-benefits of AT&T's new services, Kerkeslager indicated.

Going fractional

AT&T's Accunet Spectrum of Digital Services approaches Accunet T1.5 in price but does not require T1 overhead

Comparative price for a 100-mile, 64K bit/sec. circuit	
• Accunet Spectrum	\$1.00
• AT&T analog private lines	\$1.15
• AT&T Dataphone Digital Service	\$4.83
• Accunet T1.5 services	\$0.69*

* Price per channel; 28-channel minimum

SOURCE: AT&T

CW CHART: JOHN YORK

major network equipment providers, also has a strong interest in fractional T1 links, according to David Langhoff, telecommunications planning manager at the department store chain.

While no regional operating company has announced a fractional T1 service to date, several regional carriers — Nynex Corp., for example — are considering fractional T1 offerings

AT&T is negotiating with all seven regional holding companies to provide a Spectrum equivalent by the fourth quarter, he added. Right now, Accunet Spectrum is accessible via local leased-line T1 or Dataphone Digital Service links.

AT&T's Accunet Spectrum tariff goes into effect June 11, with availability in 24 cities initially and 175 by year's end.

ICA spotlight to hit ISDN

BY ELLIS BOOKER
and ELISABETH HORWITT
CW STAFF

Integrated Services Digital Network (ISDN) will dominate the 25th annual International Communications Association (ICA) show next week in Dallas, with a slew of product rollouts expected at an event that ICA claims will be the largest ISDN interoperability demonstration to date.



tions in multivendor, multiapplication environments. Delivered out of MCI's Kingsbridge Corp. Campus network control center in Piscataway, N.J., it will be available to customers worldwide.

Among the non-ISDN entries at ICA, Digital Equipment Corp. is expected to announce an agreement to recommend and maintain products from New York T1 switch vendor Stratacom, Inc. as well as a Decnet server for IBM 3270 terminals.

The ISDN demonstration will involve 60 applications and close to 40 customer-premise equipment and software vendors. Participants will include AT&T, Hayes Microcomputer Products, Inc., IBM, Northern Telecom, Inc. and Southwestern Bell Telephone Co. Among the applications to be demonstrated are local-area network bridging, screen-sharing and incoming call identification.

At the demonstration, 215 ISDN Basic Rate Interface lines, each supporting two 64K bit/sec. digital channels and a separate D channel for signaling, will be routed among central office switches from AT&T, Siemens Public Switching Systems, NEC Corp. and Northern Telecom. However, interoperability of multivendor ISDN switches, needed for widespread deployment of ISDN-based services, is still in the prototype phase, said Southwestern Bell spokesman Bill Motchan.

Among the ISDN-related announcements expected are the following:

- General Datacomm, Inc. will show what it calls the first ISDN-compatible multiplexer. The Megamux TMS, a software and hardware upgrade to General Datacomm's Megaswitch multiplexer, uses ISDN's supervisory D channel to route the 23 64K bit/sec. B channels in a Primary Rate Interface ISDN link but also can embed this routing information in each B channel, allowing the unit to operate over non-ISDN public networks. The multiplexer can provide fractional T1 and also reportedly can support voice compression from 32K down to 16K bit/sec., even though 64K bit/sec. voice compression is standard with ISDN.

- Bellsouth Corp. and Southwestern Bell are expected to announce the first ISDN trial between two different Bell operating companies. An undisclosed interexchange carrier will handle routing between the two regional carriers' local access regions, Motchan said. Southwestern Bell will also announce additional ISDN user contracts, he added.

- Northern Telecom will announce X.11 Release 13, software that reportedly provides the first full set of ISDN functions for its SL/1 private branch exchange. The software, which is priced at \$4,040, is said to allow multiple SL/1s to route calls back and forth over an ISDN Primary Rate link while using the ISDN D channel to exchange information such as caller identification.

- MCI Communications Corp. plans several announcements, including the debut of both ISDN and "ISDN-like" services based on Signaling System 7.

Meanwhile, MCI International, Inc. will announce Comm Advantage, a service that consolidates worldwide data, facsimile, voice and messaging applica-

AT&T jumps the gun

AT&T Network Systems made its own pre-show ISDN announcement last week, introducing the Integrated Access and Cross Connect System.

The central office-based networking device is said to allow users to dynamically allocate voice and data bandwidth — not just channels — within an ISDN Primary Rate Interface or ordinary T1 link.

This is especially useful for data applications that demand more than the traditional 64K bit/sec. circuit supplied by ISDN and T1 devices, according to Bart Stuck, a principal at Strategic Business Planning Associates, a consulting company based in Summit, N.J.

The new system packetizes both voice and data and uses ISDN's Local Access Protocol D to handle bandwidth allocation, error correction and routing among T1 or ISDN networking devices, an AT&T spokesman said. Local carriers can use the device to provide "virtual networks" in which users pay only for the bandwidth they use, he added.

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DBMS

FROM PAGE 1

er, OS/2 Extended and Oracle, and expects to reach a final decision next year.

"There is a consistency of use, and the SQL relational DBMSs are more flexible," said Taylor, who is project manager-process/special systems at Baltimore Gas & Electric Co.

But even while these markets fragment, there is a strong force toward standardization. The number of systems the MIS de-

partment will support is narrowing (see chart at right).

Dbase is clearly still the dominant player. Of the organizations surveyed, nearly 70% currently use Dbase. Upgrading to Dbase IV, the firm's newest version, may not be so simple. Only 47% of the organizations plan to upgrade within the next two years. Despite the hodge-podge of new features, more than 60% of those who plan to upgrade said they would do so for performance improvements.

Among the reasons cited for upgrading are ease of applica-

tions development (44.9%), compatibility (43.6%), additional Dbase commands and the SQL components (42.3%).

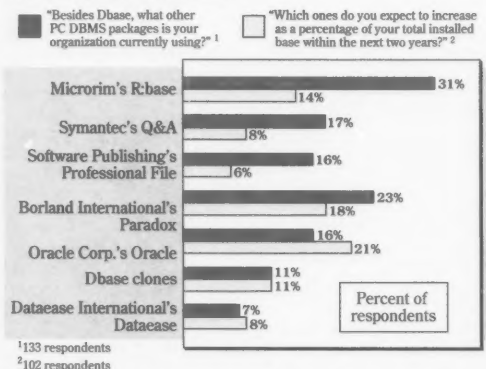
Some caution that Ashton-Tate must get its act together and begin connecting efficiently to SQL back ends if it wants to keep users happy. "If they don't come with SQL connectivity soon, I will dump Dbase," said Ivan L. Gelb, president of Gelb Information Systems Corp., a mainframe consulting firm. While Dbase IV includes SQL, the package does not yet communicate effectively with other SQL-oriented systems.

The big winner in all of this appears to be SQL kingpin Oracle Corp. Twenty-one percent of users surveyed said they plan to increase the use of Oracle on PCs within their shops.

Increasingly, servers are driving buying decisions, and here, OS/2 Extended carries some substantial weight. For Pacific Sentry Advisors, SQL on the back and the front end is clearly the way to go. The arm of Security Pacific National Bank plans to use Gupta's SQLbase as a database server and is relying on custom Microsoft Windows

PC DBMS shakeup

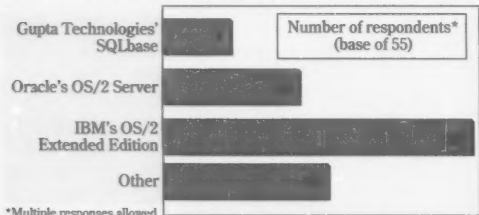
Dbase competitors wax and wane



SOURCE: A COMPUTERWORLD EDITORIAL ADVISORY BOARD SURVEY
CW CHART: FRANK C. O'CONNELL

If not SQL Server, then what?

Users who plan to implement other LAN-based database servers within the next two years are considering these products



SOURCE: A COMPUTERWORLD EDITORIAL ADVISORY BOARD SURVEY
CW CHART: FRANK C. O'CONNELL

M&D previews SAA function

BY AMY CORTESE
CW STAFF

NATICK, Mass. — Lifting the veil on future products that will comply with IBM's Systems Application Architecture (SAA), McCormack & Dodge Corp. last week previewed software capabilities based on client-server computing.

M&D showed a personal computer using SAA's common user access issuing identical queries to VSAM files and DB2 data. Data from both VSAM and DB2 was then gathered into the same report. Such capabilities will be available in M&D applications within the next 12 months.

"As a data retrieval mechanism, it will be a neat way for me to access a DB2 or VSAM file," said Jack Morgenstern, vice-president of information systems at Merrill Lynch & Co. in New

York. Morgenstern is in charge of a shop that uses McCormack & Dodge general ledger software with both VSAM and DB2 data. Currently, users employ one of several report-writer software packages for personal computers running MS-DOS.

"This will eliminate having to use separate report-writer packages. It will save on training," Morgenstern said.

While this functionality would allow DB2 and VSAM data to be combined in reports, it does not allow for updates across dissimilar files. M&D said that update was the next logical step but would not commit to it.

The preview of SAA-compliant functions precedes IBM's widely expected announcement of SAA Office, the firm's re-architected office automation software that would be IBM's first fully SAA-compliant application.

M&D claimed its query demonstration will be consistent with all future SAA applications. M&D has reportedly been participating in an SAA study program with IBM.

A major advance for M&D is the use of intelligent communications between hosts and PCs through IBM's LU6.2 protocol. Much PC-to-host communication today is done through LU2 communications, in which the PC is no more intelligent than a dumb terminal. M&D's present offering uses LU2. But M&D laid out plans to provide a level of cooperative processing between the host and DOS or OS/2 workstations through LU6.2. By issuing an SQL query from the workstation, DB2 and VSAM data can be downloaded into a relational table for reporting.

A user can formulate a query through IBM's OS/2 query manager. Millennium, M&D's development and execution environment, receives the query and directs it to either DB2 or Millennium VSAM files. The data is then extracted and downloaded in the form of relational tables.

"Any data that's been defined to Millennium is available to this," said M&D corporate Vice-President John Birch.

M&D's strategy calls for co-existence of LU6.2 and LU2 as well as MS-DOS and OS/2. Co-existence of M&D's VAX products with M&D's IBM offerings is also a goal for M&D, which the firm said it hopes to realize through LU2 and SQL.

Wang gets urgent calls for corrective action

BY PATRICIA KEEFE
CW STAFF

LOWELL, Mass. — Wang Laboratories, Inc. stepped up its cost-cutting efforts last week under pressure from nervous investors and users who are getting strident in their calls for Wang to turn things around — quickly.

Speaking at an analysts' meeting here last week, company President Frederick Wang apologized and took responsibility for the firm's financial woes, which resulted in the surprise announcement of a \$63.7 million third-quarter loss (CW, April 24). "It's not that they didn't have internal controls in place but that interpretation of the resulting information was not as astute as it should have been," said Cliff Friedman, an analyst at C.J. Laurence in New York.

Following that meeting, the minicomputer maker announced that 14 top executives will take pay cuts ranging from 5% to 20% until the firm returns to profitability. "That's nice, but it's not enough to help," said Friedman, adding that more aggressive plans to reduce costs will help.

In addition, previously announced plans to eliminate 1,700 positions will be greatly accelerated.

Prior to releasing third-quarter results, Wang had said it

planned to reduce its worldwide work force from approximately 30,200 to 28,500 by June 1990, mostly through attrition. Last week, Wang pushed the target date up to September, jacking up the monthly average needed to meet that goal to 283 jobs. Wang's monthly attrition averages between 200 and 300.

"It's fairly clear that there will have to be layoffs, and when you speed [the reduction plan] up, the likelihood is higher," a spokesman said, hinting at more layoffs in field service.

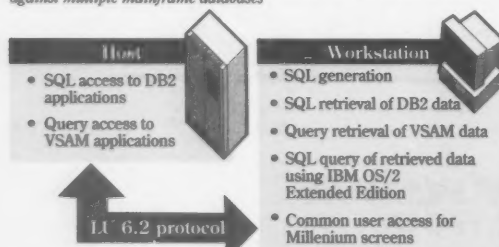
With few exceptions, Wang users interviewed last week are anxious for Wang to get its financial house in order, although they added they are confident about the company's future.

This did "cause consternation among senior management, and I had to spend time dealing with it that might otherwise have been spent doing my job," said an MIS manager at a Fortune 100 chemical company. "We want our strategic vendors to be healthy. We're not going to take a short-term reaction here, but they had better clean up their act financially, or my management will murder me."

A recent survey of Fortune 1,000 accounts by Forrester Research, Inc. in Cambridge, Mass., found that financial issues, more than anything else, are most likely to knock vendors off a user's short list.

SAA it better

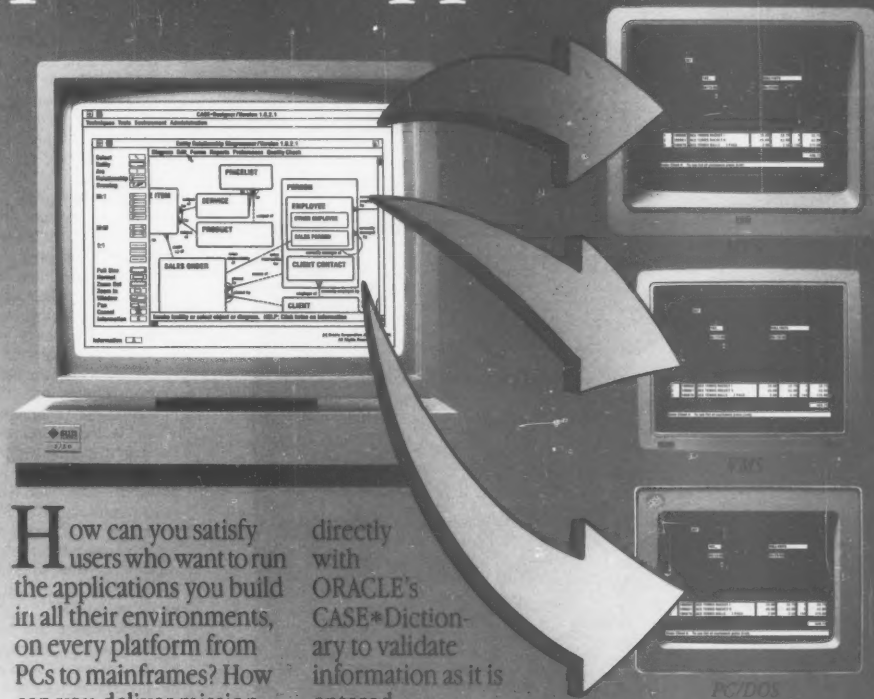
McCormack & Dodge sees OS/2-based PCs performing complex queries against multiple mainframe databases



SOURCE: MCCORMACK & DODGE

CW CHART: JOHN YORK

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COMPUTERWORLD

Hired guns

FROM PAGE 1

"No matter what security measures you employ, they should be reviewed and audited to make sure security for the system is adequate," said Paul Zittau, director of electronics information security at Du Pont Co. in Wilmington, Del. He said

the company has used tiger teams several times.

Using tiger teams — whose name and tactics are borrowed from the U.S. Air Force's counterintelligence teams that test security at air bases — is somewhat controversial because MIS is often unaware that a team is about to strike. Unexpected visits by tiger teams are traumatic for MIS workers and end users

who are caught napping and may reveal little about a system's security weaknesses, argued Harry DeMaio, national manager of Protech/Information Protection Services at Deloitte Haskins & Sells, a Big Eight accounting firm. "The problem we have with the commando raid is that you can do damage — psychological and physical damage — and blow a few people out of

their jobs," DeMaio said.

However, other security experts argue that the teams work best when least expected. "If they are going to have an effect, then they should attempt to catch people in the act of being themselves," said George Caldwell, a certified protection professional in the risk management security division at Bell Atlantic Corp. in Arlington, Va. It is not

unlike being visited by auditors, who seldom announce when they intend to show up, he added.

Critics also charge that the tiger team technique may only "find one hole in what is probably a Swiss cheese anyway," as one security professional put it.

A bigger problem for MIS is if an outsider succeeds in breaching system security, said Ted Rock, manager of mainframe software support at Harris Bank in Chicago. "I would rather have a team sanctioned by management get into the system than somebody from outside who embezzles money from this bank. That is when I would really be in trouble," he said.

Reasonable tigers

A penetration study — the industry's term for the sorts of activities that tiger teams engage in — is a reasonable approach to testing systems security if it is planned with the involvement of both top management and MIS, DeMaio and others said.

Others see advantages in the undercover approach. "There is a market for companies that want the undercover approach because it can be the most revealing," said Peter Goldis, a hacker-for-hire who specializes in electronically attacking computer systems. There is no other way for management to know for certain that what MIS has been saying about its security is indeed true, he said.

Goldis has tested computer systems security at more than 25 top corporations in the last three years for fees of \$10,000 and higher.

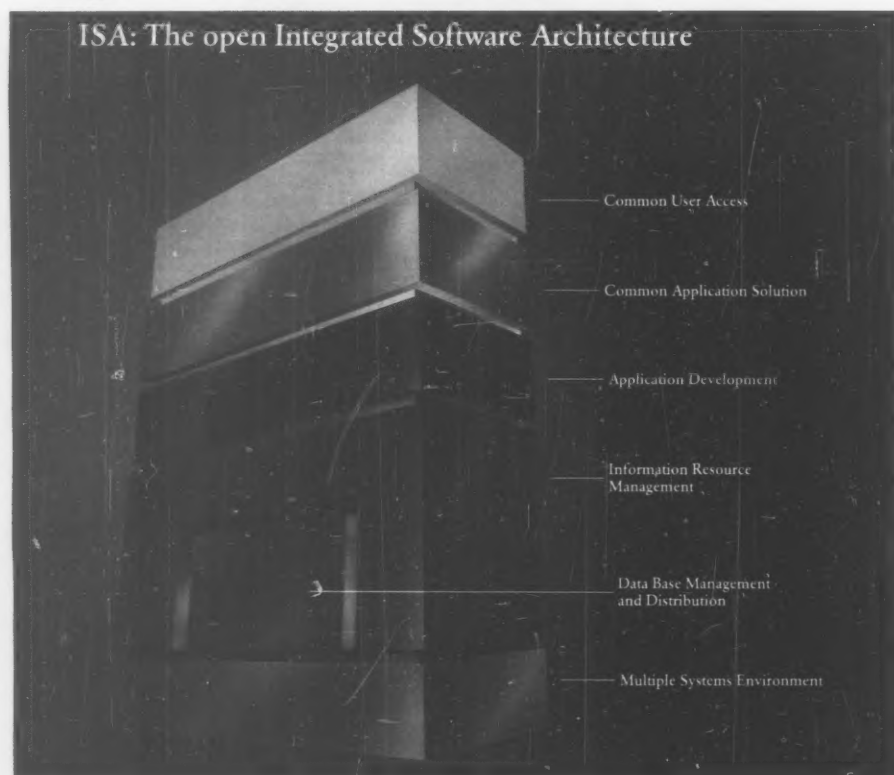
"They may have installed one of the top access-control products — RAC-F or ACF2 or Top Secret — and they want to know if they overlooked something," Goldis explained. "To test the system, they define a target, create a data set and protect it with all of the mechanisms that are available to them. Then they say to me, if you can update it or even look at it, then we are convinced that we have a problem. It eliminates any ambiguity of what I am setting out to accomplish."

Though Goldis declined to disclose the names of his clients or talk about the work he has done for them, he said that he has never failed to uncover security loopholes in their systems.

When Dennison Manufacturing Co. in Waltham, Mass., hired Goldis last year to test its computer security, "he opened management's eyes," said Louis Pintsopoulos, who supervises the auditing of electronic data processing at the company.

"I hired him because there was another level of security that needed to be addressed but was too specialized for MIS," Pintsopoulos said. "There are not a lot of people who can do what Peter can do to resolve the problems and also know what the ramifications are."

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E-mail services get it together

BY PATRICIA KEEFE
CW STAFF

BOSTON — Efforts to consolidate multiple messaging services onto one network got a stamp of approval last week from Softswitch, Inc., which posted

eight product introductions designed for building and managing electronic "post offices."

Specifically, the gateway supplier extended its open protocol support to include X.400 and Transmission Control Protocol/Internet Protocol (TCP/IP), ex-

panded the number of electronic mail systems with which it will interoperate and beefed up its mail-management tools.

"Business needs an enterprise networking approach to electronic mail that addresses the key issues of connectivity,

management and mail-enabled applications," Softswitch President Michael Zisman said.

He suggested that by reducing the complexity of these networks via consolidation and allowing open but controlled access based on standards, users can develop strategic applications that transform E-mail into a bottom-line resource.

Those comments reflect a

growing trend among users to link multiple multivendor E-mail systems by using third-party gateways from vendors such as Softswitch or by demanding that their suppliers adhere to the X.400 mail gateway. For example, the Aerospace Industry Association is currently conducting an X.400 trial among member companies with a number of suppliers of public and private messaging systems.

Softswitch is hoping to capitalize on that trend with its latest round of announcements:

• **E-mail connectivity:** X.400 gateway, Simple Message Transfer Protocol (SMTP) Gateways for IBM's VM, MVS and Systems Network Architecture Distribution Services Gateway/Network Courier.

• **Mail-backbone management:** Directory Services and Access Control Facility.

• **Mail-based applications:** Distributed Print Services, Distributed Library Services and Softswitch Application Program Interface.

The X.400 gateway reportedly enables users in a Softswitch network to connect X.400-compliant mail networks, including Telenet Telemail 400 and MCI Communications Corp.'s MCI Mail, while simultaneously connecting to multiple public mail networks.

The X.400 gateway is shipped as a complete package of hardware, systems software and applications software. It is priced at \$60,000.

Traffic control

When combined with Softswitch Central, which is used to control the flow of traffic across the backbone, and other Softswitch products, the X.400 gateway is said to allow users of mail systems from IBM, Digital Equipment Corp., Wang Laboratories, Inc., Hewlett-Packard Co., Data General Corp., 3Com Corp., Novell, Inc. and Banyan Systems, Inc. to communicate with public mail carriers.

A four-level access control helps users provide an open but controlled multivendor environment. The Names Directory auto- and self-registration facilities — all components of the new Directory Services software — eliminate complex X.400 naming problems, the vendor said.

The SMTP gateway addresses users who need to link to TCP/IP networks, including Unix mail systems, through SMTP. The product has been installed in several federal agencies since September 1988 and can be licensed for \$25,000, the company said.

The Names Directory is now a standard database provided and managed by Softswitch Central. It reportedly describes mail users internal and external to enterprise mail networks.

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Ashton-Tate Fights SQL Bugs *Same Query Run Twice Can Result in Different Replies*

Ashton-Tate last week acknowledged that the Structured Query Language (SQL) portion of dBASE IV can produce inconsistencies and inaccurate results.

The crux of the SQL problems lies with those anomalies that occur when data is structured in a specific way, according to Kent Richardson, a spokesman for the Torrance, Calif., firm. As a result, the same query run two different times can result in two different replies, for example, or a query

can retrieve incomplete information from the database. (See Chart, Page 8.)

Ashton-Tate does not plan to issue a disclaimer to fix the problem; it is, however, offering work-around solutions to users through its support lines and bulletin board, and on CompuServe, Richardson said.

Though Ashton-Tate is characterizing dBASE IV's SQL problems as "minor" and confined to specific circumstances, database experts claim their impact is more serious.

"The SQL in dBASE IV is unstable, unreliable and unpredictable," said Richard Finkelstein, president of Performance Computing Inc., a database consulting firm in Chicago.

"I don't see how anyone can use it," he added. "They'd have to know the answer to the SQL query ahead of time."

Surprisingly, the majority of dBASE users were unfazed by dBASE IV's SQL glitches.

"The drawbacks in SQL are an

See DBASE Page 8

PC Week, January 9, 1989

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Criticism builds over impact of look-and-feel litigation

BY MICHAEL ALEXANDER
CW STAFF

The look-and-feel battles being waged in courtrooms by Apple Computer, Inc., Lotus Development Corp. and others are beginning to draw criticism from influential circles.

Three respected MIT computer scientists, including Artificial Intelligence Laboratory founder Marvin Minsky, ran a half-page advertisement in *The Tech*, an

MIT student newspaper, attacking Apple and Lotus for attempting "to create a new form of legal monopoly... that would cause serious problems for users and developers of computer software and systems."

The ad was co-sponsored by Richard Stallman, a self-described computer hacker who developed Emacs, a widely used computer programming editor, and Gerald J. Sussman, a professor of electrical engineering at MIT.

"If Lotus and Apple are permitted to make law through the courts, the precedent will hobble the software industry," the ad said. Software will be more expensive, users will be locked into proprietary interfaces, and large companies will use the threat of lawsuits to cow their smaller competitors, according to the ad's authors.

Lawyers keep off

The ad, which was labeled a "paid political advertisement," proclaimed in boldface headlines: "Computer Scientists, Watch Out!" and "Keep Their Lawyers Off Our Computers."

The artistic expression of an interface should be protected, but the ways that commands are invoked should not be, sev-

eral developers said. If developers are forced to contrive meaningless variations in their interfaces simply to avoid legal entanglements, users will be confused and dissatisfied.

"People should be able to copy the underlying ideas, just like Apple did," said Andy Hertzfeld, who designed the user interface tool for the Macintosh. "We could not have done the Mac if this sort of legal paranoia was present."

Hertzfeld, who has been an independent developer since leaving Apple about five years ago, said he hopes to file a friend-of-the-court brief on behalf of Microsoft Corp. and Hewlett-Packard Co., co-defendants in the Apple lawsuit.

"I feel strongly that the court will decide that an idea can be protected at a lev-

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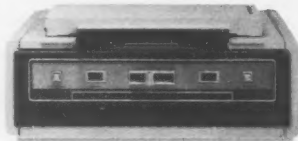
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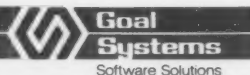
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MIT's Minsky and others lashed out at Apple and Lotus in a paid political ad

el that would be a deterrent to developers," Hertzfeld said. "I created a lot of the ideas being contested in the Microsoft case because we were free to do what we thought would do best for users and customers, without need for legal help."

Inventing an entirely different interface for each new product would be impossible, Stallman said in an interview last week. "Even geniuses occasionally have to copy ideas from others," he said. "An interface is a creation of collective efforts, with each person adding different wrinkles and ideas. It does not spring from any one person's brain like Venus out of the ocean."

Windows group halts Mac work

Apple's lawsuit so outraged The Windows Support Group, Inc. in New York that the software developer halted its Mac software development work, said William Cornfield, the firm's president.

"I absolutely believe that we should protect original thought and creative expression, but the look-and-feel issue is beyond the bounds," he said.

Executives at Apple and Lotus declined to comment on the advertisement or developers' opinions.

A new survey of nearly 200 MIS executives by *Computerworld* indicates that the lawsuits may be hindering sales of copycat products. When asked if copyright litigation will have an impact on their buying plans, 30.5% of respondents said that the look-and-feel lawsuits will cause them to shy away from software clones.

"If they lose, you are out in left field," said Patrick John Lee, data processing manager at Towncraft, Inc., a direct sales organization based in Glenrock, N.J.

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	San Francisco	March 29, May 18
	Santa Clara	March 9
	Universal City	April 6
COLORADO	Englewood	March 7, June 6
CONNECTICUT	Farmington	March 7
	Stamford	March 21, June 8
FLORIDA	Tampa	March 22
GEORGIA	Savannah	April 27
HAWAII	Honolulu	March 14
IDAHO	Boise	April 13
ILLINOIS	Chicago	March 21, April 18, June 14
INDIANA	Indianapolis	March 22, June 7
KENTUCKY	Louisville	April 4
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	Burlington	March 15
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	Columbia	March 15
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	Grand Rapids	March 8, June 6
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Oracle pumps security effort

BY PATRICK WAURZYNIAK
CW STAFF

BELMONT, Calif. — Oracle Corp. last week created an independent business unit to develop high-security relational database management system applications.

The move comes two months after Oracle competitor Sybase, Inc. shipped beta-test copies of the Sybase Secure SQL Server, which the firm touted as the first

RDBMS to meet government standards for B1- and B2-level security for multilevel data.

An Oracle research and development contract with the National Computer Security Center (NCSC) will be a primary management focus for the new busi-

ness unit, Oracle said. Oracle, which in July landed the 28-month NCSC research and development contract, is scheduled to deliver a series of five prototypes, along with internal and end-user documentation, test suites and other related materi-

al, as part of the contract with the federal agency.

Oracle Secure Systems will be headed up by Linda Vetter, former vice-president of operations at Key Logic, Inc., a Santa Clara, Calif.-based systems software vendor specializing in high-performance, high-security operating systems.

Oracle has officially submitted a version of its secure data-

base to the NCSC for evaluation, and the firm plans to incorporate the results of the R&D effort into its next RDBMS version. Vetter said that the NCSC's security standards have not been published yet, and no database vendor has had an official evaluation to date. But she added that Oracle is expecting to deliver a number of systems with B-level secure databases during 1990.

Unix groups backing up their words

BY AMY CORTESE
CW STAFF

The Unix standards consortiums are busy making good on promises.

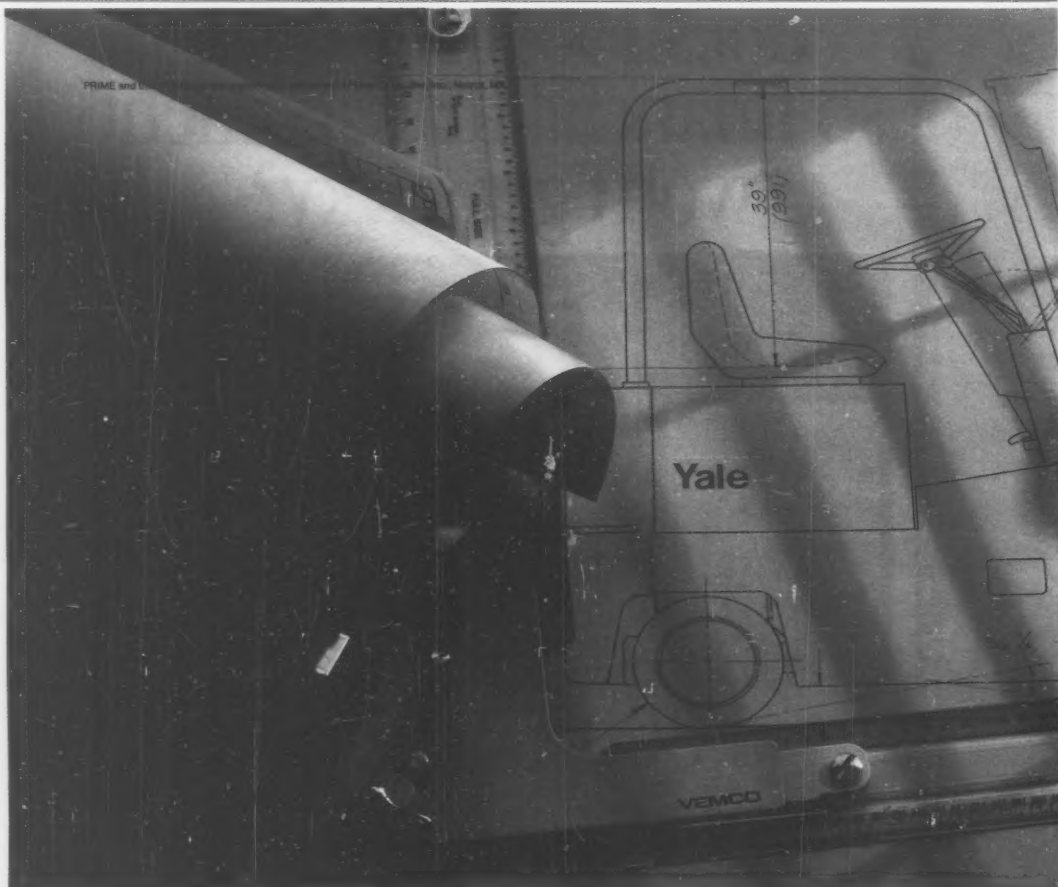
The Open Software Foundation (OSF) last week issued a request for technologies (RFT) that will simplify the distribution of Unix application software by providing a single format rather than a separate one for each hardware architecture. With this technology, called architecture neutral distribution format, the OSF seeks to "make purchasing software as simple as renting a videotape," an OSF official said. Proposals are due in October, and the OSF expects to narrow down the candidates by January 1990.

The Cambridge, Mass.-based consortium recently completed an RFT for a graphical user interface, resulting in OSF/Motif.

Meanwhile, Unix International, Inc. is tackling multiprocessing technology for Unix, having issued a call for papers several weeks ago.

Those will be reviewed to generate a series of requirements that will then be submitted to AT&T's Unix Software Operation, which will then present Unix International with an implementation schedule by year's end, the group said.

The *Computerworld* bulletin board has been enhanced with an open forum for general discussion and E-mail to our staff and other registered bulletin board users. Call and fill out our on-line survey so we can add features that interest you. We now have three lines: 508-626-0214 and 508-626-0235 (up to 2,400 bit/sec.) and 508-626-0165 (up to 9.6K bit/sec.).



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Suit questions software role in nuclear war

BY J. A. SAVAGE
CW STAFF

A lawsuit challenging the constitutionality of a nuclear strike commenced on the logic of computers, not ordered by Congress, has been filed in the U.S.

District Court of Northern California by the manager of administrative computers at Stanford University.

The suit filed by Cliff Johnson claims the government's artificial intelligence-based Launch on Warning system is antiquated

and that its software is unwieldy. Because of that, the U.S. is consistently on the brink of nuclear disaster, Johnson claimed.

The lawsuit names Gen. John Chain, commander in chief of the Strategic Air Command, and his Minuteman and MX missile

chain of command. An information officer at Strategic Air Command headquarters in Omaha, Neb., said Chain had not seen the lawsuit and had no comment.

The U.S. Department of Defense has been vague in the past on whether it has Launch on

Warning capability. According to Johnson and other sources, Launch on Warning is an automated system that decides whether the U.S. is under attack and indicates whether to launch a counterattack.

The two-tiered system relies on radar and satellite information to detect warning signs of a nuclear attack and relay that information to military officials.

"It's mostly a heuristical approach to statistics, similar to the way the USS Vincennes shot down the Iranian Airbus" in July 1988, Johnson said. "You can't have a safe decision in less time than it takes to have a cup of tea."

War games

A second tier of computer involvement advises the military that missiles have been fired. Flight paths are shown on a big screen, similar to that in the movie *War Games*.

The tactical tier has had its share of miscommunications. When it was activated in 1980, crews were sent to start their aircraft engines "in order to prepare for takeoff should that become necessary to survive," according to a report issued by then-Sens. Barry Goldwater and Gary Hart.

Gary Chapman, president of Computer Professionals for Social Responsibility, said the software used in this military endeavor, as well as other software, is unreliable. "They can tweak it from now until eternity, but we're reaching the upper limits of cognitive capacity of human beings to debug software," he said.

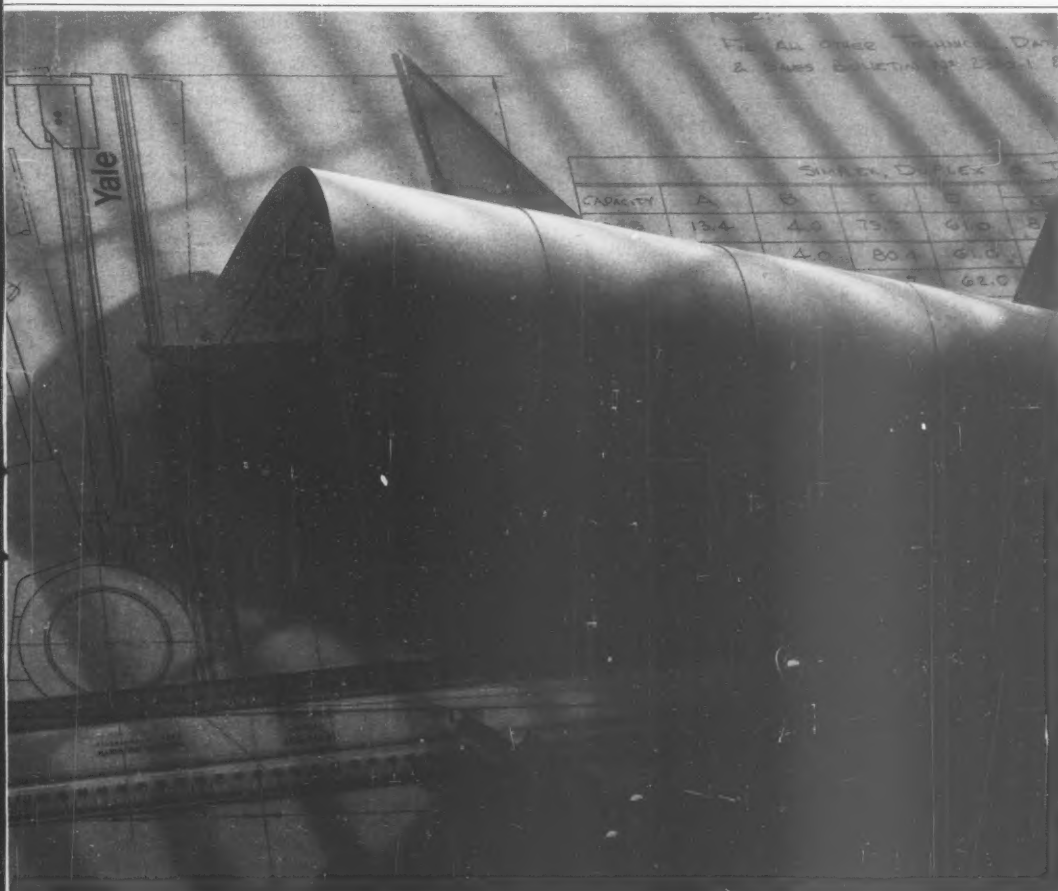
A spokesman at Rand Corp., a Santa Monica, Calif.-based research company that developed AI software for nuclear attack and response modeling for the Pentagon, said that while his company's software is not used to automatically trigger nuclear war, the issue of allowing software to make such decisions should be examined.

Johnson's lawsuit also charges that computers take away the decision from elected officials of whether to launch a counterstrike.

"Simply because of computer prompts, a virtually immediate launch under attack decision is mandated, and that decision is based fully on the information provided by computer," the lawsuit said.

Johnson said Launch on Warning violates the part of the Constitution that spells out that Congress, not the president or a computer, has the ability to declare war.

This is Johnson's third attempt to challenge the issue with a lawsuit. His first one was filed in 1984 and refilled in 1986. Johnson said this lawsuit would exhaust the "proper legal channels" and enable him to take his case to the U.S. Supreme Court.



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More than just-in-time

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Editor's note: This is one in a series of profiles of nominees for the Computerworld Smithsonian Awards, recognizing individuals and organizations that have achieved outstanding progress for society through the use of information technology. The awards will be presented in a ceremony held June 20 in New York.

BY ELISABETH HORWITT
CW STAFF



organizational systems.

Eaton Corp. is a classic example. About a year after its truck transmission manufacturing business implemented just-in-time scheduling, management decided that the system needed to be fed more detailed data about component production cost and scheduling. The result was a distributed IBM Personal Computer-based factory-monitoring system that promises not only to cut costs and increase quality but also to give factory floor workers far more responsibility in the manufacturing process.

A prototype system, which became operational in one factory cell last October, uses IBM PCs to collect and analyze in real time all information relative to machine use, good and defective parts produced, production-related costs and inventory work in process. That information is broadcast across the factory via a Novell, Inc. Netware 2.1 local-area network.

Cutting edge

The monitoring system broke ground in two areas, according to Larry Cook, a microcomputer systems administrator at Eaton who co-directed the project. First, it provides detailed cost information, such as the cost of a machine idling, shut down or producing, compared with a typical system that only provides "gross utilization" data about parts produced per hour, he said.

Second, by implementing IBM PCs on the shop floor, Eaton got workers directly involved in the cost analysis. Gaining real-time access to cost analyses has encouraged workers to take far greater responsibility for decisions, such as when or whether to scrap a part, Cook said.

Only four months after the prototype

was installed, Cook's group has already observed "a heightened awareness among operators" of cost issues such as how much it costs to scrap a part after it has gone through several segments of the production cycle, after which "you lose not only the raw materials cost but the production costs as well," Cook said. Workers are also making more indepen-



T.J. HAMILTON/PICTURE GROUP

Cook added the right details to get control over costs, scheduling

dent decisions about when to scrap a part or adjust a machine, where before they needed to consult a foreman or technician, Cook said.

The final result: "Problems are stopped quicker," Cook reported. Another result, at least as important, is that factory workers learn new skills, and there is a reduced need to involve trained technicians in factory floor decisions.

Cost benefits

"The ultimate benefit of the system is to get better control of our costs," Cook said. The system promises to cut inventory by providing more effective scheduling of shop floor resources.

In addition, it offers the potential of cutting production time and increasing quality levels, Cook said.

A team composed of Cook, a manager of cost accounting and several factory shop employees worked together to design the application. Choosing to use PCs resulted in substantial cost savings over traditional minicomputer-based factory systems, Cook said. They also saved Eaton money on software development costs, which involved six to 10 people on a part-time basis, he added.

Eaton contracted with Lotus Development Corp. to develop the data collection and analysis system, based on the software vendor's Symphony package. The system was kept simple, Cook said, to minimize the resistance of factory floor personnel who were dealing with a computer for the first time. Most functions are initiated with one keystroke.

"One of the best benefits was the rapid acceptance of shop floor personnel. We had some concerns about that, since shop floor people are the system's ultimate users, but they have accepted, learned and love it. They are not afraid of it at all," Cook said.

Round 2

The second phase of the project, which is scheduled to be installed by the third quarter, will provide a link between the factory monitoring system and the back-office IBM mainframe for uploading "everything from payroll to raw material costs to subcomponent costs," Cook said.

Also scheduled for Phase 2 is a concurrent presentation on a PC screen of cost information and a schedule of parts to be produced, so that the operator and supervisor can track cost and performance as they relate to a just-in-time cell production schedule.

After Phase 2 is completed and evaluated, Eaton will decide whether to go factorywide with its system.

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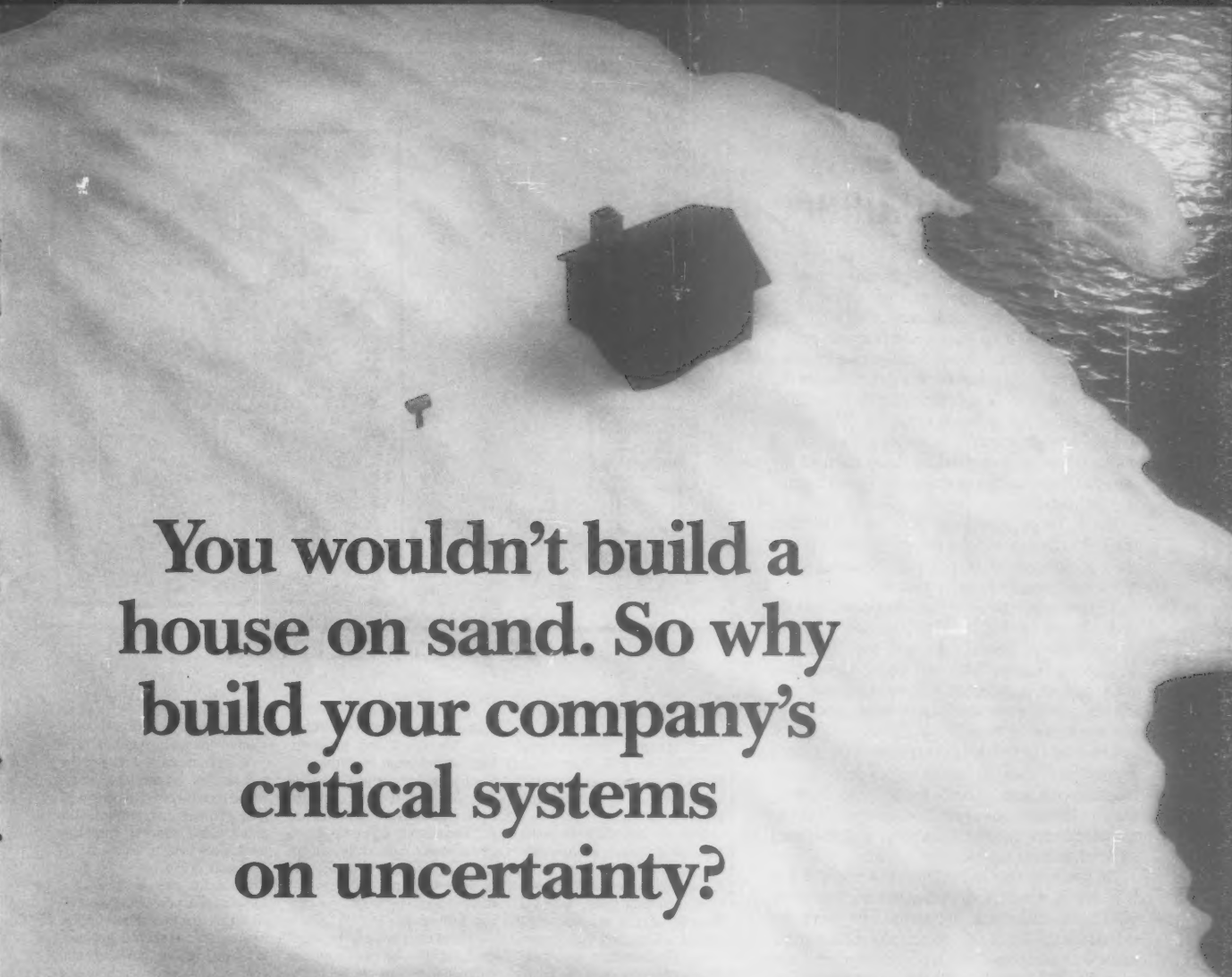
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EDITORIAL

A delicate balance

ANY SYSTEM OF regulatory oversight contains the potential for abuse. That potential is grossly magnified when the system is a pervasive, nationwide one.

Today's information systems enable the federal government to monitor minute details of the lives of virtually all its citizens. Until recently, the potential for a Big Brother in Washington was limited by the government's access to data it gathered on its own from agencies such as the Internal Revenue Service and the Social Security Administration.

But in recent years the feds have extended their electronic tentacles more aggressively into the private sector [CW, April 24], creeping slowly yet inexorably into new databases.

To this point, not even the American Civil Liberties Union has had much to complain about regarding computerized oversight activities, and with good reason. Who will argue these days with honest, concerted efforts to catch tax cheats, monitor nuclear plants more closely or enforce antitrust laws?

Consider the federal government's increasing regulation of IS departments within defense contracting companies. Next month, the Department of Defense will announce standards for the manufacturing resource planning systems used by defense contractors.

Or consider the IS regulatory actions of the U.S. Navy, which is virtually the only customer of U.S.-based private shipyards. The Navy decided to standardize on certain information technologies to improve efficiency in ship procurement but did so only with the cooperation and participation of the major naval equipment providers.

Hopefully, the DOD's efforts to get more data throughout the procurement process will put an end to stories of \$500 hammers and \$50 million overcharges.

In terms of the creeping intrusion of the government into private-sector affairs via electronic surveillance, the ends (and the intentions) have certainly justified the means so far.

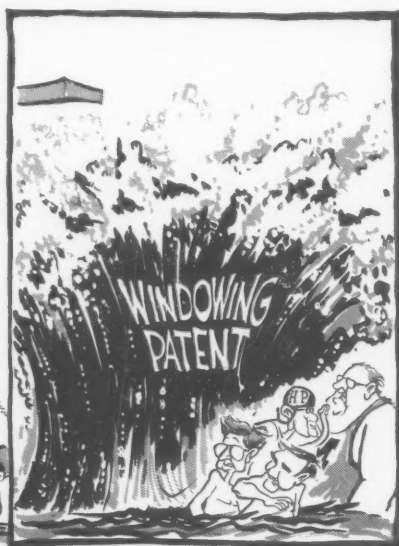
But there is a uniquely unsettling feeling that most people get when they ponder what the federal government *could* do with the growing amount of data in its information banks. It has been well-documented that the feds have demonstrated their ability to misuse information on private citizens, both during the Vietnam War and in the civil rights movement.

While the government's recent efforts to harness the power of information systems for the common good deserves applause, it must also be remembered that potential for abuse grows with each new electronic intrusion. There is an extraordinarily delicate balance between the need to know and the desire to know too much.

As historians have long noted, the price of liberty is eternal vigilance. And as IS managers well know, the integrity of the information system is only as sound as the people running it.



BY
RICHENMANT
COMPUTERWORLD



LETTERS TO THE EDITOR

Report balancing

Your recent article about AFCOM '89 [CW, March 13] failed to mention an important automation issue — automated report balancing.

Report balancing is sometimes called proofing, cross-footing, posting or reconciling. In the automated report balancing session, panelists from USF&G, Playtex Services and other organizations described their experiences with available report balancing systems.

As Jeff Schulman of the Gartner Group pointed out in his presentation, automated report balancing is one of the strategies that data center users can implement to free themselves of operational constraints. Automated balancing can help eliminate re-runs, accelerate the delivery of accurate reports and contribute significantly to improved data center throughput.

Joel Shufin
Manager
Marketing Communications
Unitech Systems, Inc.
Liste, Ill.

Seeking Wizards

Regarding the article "Help Wanted: Heroes and visionaries preferred" [CW, March 20], I feel that the author has a limited view of the present computer professional.

The first mistake is stating that all professionals work in large IBM shops. In most of these shops, the people are somewhat stagnant in their role in data processing. This is brought about by a limited exposure to all the uses of the present technologies. They are all specialists, they work on only one system or project.

In the medium-size non-IBM shop, this is completely different. Managers and programmers must look at everything on the computer, not just one system. They must learn the business, almost as well as the owner. A small staff has to support all departments, from accounting to engineering, which forces the medium-shop pro to be open-minded and up-to-date on current technology.

The second point is the list of qualifications for the positions outlined in the article. All of the qualifications stressed advanced degrees. What about us poor slobs who came up from the bottom? Colleges stress structure, methodologies, buzzwords and other concepts. These are exactly the things that an innovative professional will not use; he will come up with his own ideas. One of the worst managers that I ever worked with was the most educated. He believed what he was taught in college was the only way to do it.

So, if you are looking for "Witch Doctors, Magicians, and Wizards," keep looking. They exist, just usually not in large structured organizations. That environment is just too stifling for us old, uneducated, balding DPs who can get more out of a MIP than any large IBM shop.

Bruce R. Pratt
DP Manager
Downey Glass Co.
Los Angeles

Selling our schools

Your editorial "Fund education" [CW, March 20] urges that President Bush fulfill his promise to become the "education president." It will be interesting to see whether he simply throws more rhetoric and tax money at

the problem, or is serious enough to propose a free-market solution to the education crisis.

Governments should sell the schools to businesses, which would be motivated to do a good job for competitive reasons. Disputes about teacher qualifications, book selections, sports issues and discipline would be a thing of the past because consumers could vote with their dollars. Privatization should appeal to teachers and their union leaders; the current governmental approach has made teaching one of the most underpaid professions in the country.

Education is too important to be left in the public sector. We need leaders who will change the rules of the game so that businesses can think of students and their parents as customers — consumers of the service of education.

Jim P. Fiegenschue
Chairman
PC Results
Double Oak, Texas

Good-looking

Kudos on your new design! In particular, I find the "Executive Briefing" section extremely useful. It is refreshing to see that the publishing community recognizes the cerebral benefits of Direct Memory Access (DMA).

Edward J. Gaudet
Manager
Boston Business Computing
Lawrence, Mass.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.

Decision skills a matter of debate

JOHN BARNES



In the last year or so, I've been present for one reason or another when high-level decisions have been made at several different companies. From this, I've gotten some insight into the decision-making process of some highly respected information systems managers. Debate judges kept coming to mind as the model of the way a smart manager's mind works, especially in upper management.

Formal debates argue such things as whether an arm of the federal government should take some specific action — a new federal law or program, a Constitutional amendment or a foreign policy doctrine. The rules ensure that debates will be won on logic and evidence. It is up to the judge to interpret those rules in deciding who won.

By comparison, managers within their area of responsibility decide what should and should not be done.

In that way, a manager and a debate judge have the same job — sorting through the evidence and logic on both sides and decid-

ing whether it has been proven or not proven that something should be done. A first-rate manager applies the same rules of logic and evidence in making his decisions that a good debate judge applies.

With that in mind, I read through some old debate handbooks. Their advice applied remarkably well to a lot of business problems. It is all common sense, but just as a concert pianist plays scales and a tennis champion practices serving, decision makers probably ought to review the basics of decision-making now and then.

Here, then, are some of the principles judges use in debates, with some notes on their real-world applications.

- Don't judge debates on presentation. The better the manager, the less likely he is to be fooled by slickness. Most of the really fine managers are experts at separating the content of incoming messages from their presentation — and throwing away the presentation.

- There are no ties — if the affirmative doesn't win decisively, the negative wins. Even a simple change of policy means the expense of distributing it and time spent on the learning curve on how to apply it effectively. So if you don't have a compelling reason to say yes, you ought to say no.

- For the affirmative to win, its proponents must prove need, inherency and sufficiency. If they fail to prove any one of these, the negative wins.

These are technical terms for three sets of basic questions:

1. Need — is there something wrong with the way things are right now? Is there a problem we can't live with, or one that costs too much?
2. Inherency — if there is a need, is it impossible to meet it with existing programs or policies? Is it clear that the status quo, even with some reforms, just can't do the job?
3. Sufficiency — will the proposed plan meet the need? Is it likely to solve the identified problem at an acceptable cost?

If you don't have all three basic needs, you don't do it. Many beginning debaters — and a lot of ineffective managers — dislike this rule. It seems like two out of three ought to win, somehow. In fact, the negative wins from 60% to 70% of the time.

If you think about it, the negative *should* win more often. A good plan is hard to find, but you only want the good ones.

Most bad ideas, especially attractive bad ideas, fail one of those three tests.

- A rebuttal doesn't defeat an argument unless the rebuttal is true, and it is impossible for the rebuttal and the argument to be



BETHANY GULLY

true at the same time. The first part, I hope, is obvious. The second part can be much less so. Here is an example: Argument: Engineers working on the technical advice hot line are needed to get Version 2.0 ready to ship on schedule.

Rebuttal: We have to have adequate coverage on the hot line or customers will be alienated and we'll get bad word of mouth.

Both speakers can be telling the truth at the same time. It is certainly possible for the engineers to be needed in both

places. In fact, if you look for the loopholes, the ways for both of them to be right, you may see several possible solutions. Maybe the hot line can be manned by someone else, or maybe you need to hire more engineers. When arguments don't clash head-on, people usually aren't perceiving all the alternatives.

If it all sounds like common sense, that is because it is common sense. But as anyone who follows technological and business news knows, common sense is not common enough.

Barnes is northwest area manager of ADG, a high-tech marketing company based in San Pedro, Calif.

MBA programs are wasted on most IS professionals

EFREM G. MALLACH



Much has been made of the need for information systems professionals to develop a business orientation. A recent University of Colorado survey of senior information managers ranked this as the top IS human resource issue for the 1990s.

"Learn about business," new systems staffers are told. "Don't be just a techie." Such a business orientation, they are lead to believe, will pave the road to the executive suite and to eternal bliss.

The standard prescription for acquiring this knowledge is the MBA. More than 72,000 MBA degrees will be awarded in 1989, up from only 6,700 as recently as 1965. Many of these new degree holders are IS personnel who hope to learn what business is about. Clearly, somebody in IS is

listening to the advice and acting on it.

Unfortunately, the prescription in this case does not match the disease. MBA programs are well designed for their primary audience. They serve its needs well. But they are overkill for the IS professional or manager who needs only to see the big picture of his business.

Most MBA programs are not meant to and do not meet the needs of information specialists who want to improve their feel for their firm's business. These programs offer, at the same time, too much and too little.

An MBA program offers too much because it covers a great deal of material that is not useful for this purpose. An accredited MBA program includes 16 to 20 courses over two years of full-time study, or four years of evening classes and a limited social life.

Starting with calculus, students progress through statistics before delving into production and quality control methods. They study business law, economics at several levels and enough accounting to take a stab

at the certified public accountant exam.

They pick a concentration in which they take four or five advanced courses. Naturally, these are all useful. They stand graduates in good stead as they progress up the corporate hierarchy, deal with issues from assorted areas or manage their firm's strategies in the international arena.

MBA inadequate

An MBA program is also not enough for the IS professional. By definition, most of the program deals with universal principles. Students learn a great deal about choosing the point on cost-and-demand curves at which profit is theoretically maximized but little or nothing about why their employer priced a new toaster at \$49.95 instead of \$52.50.

Graduates of MBA programs are still left with little or no information about what their employers do, what key issues they face, who their competitors are or how they are faring in the marketplace and why.

Some of these problems are inherent in the nature of an institution open to members of many organizations. It is unreasonable to ask the East Fostick Business School to offer a course called "History, Structure and Mar-

kets of Fostick Elbats, Inc.," even if Fostick is the largest employer in town. The best one can hope for is "History, Structure and Markets of the Elbat Industry." The basic problem, however — trying to solve one problem with a tool designed for another — can be addressed.

One model I have seen that helps solve it can be found in the Doctorate in Engineering program at the University of Lowell in Lowell, Mass. The program is designed for students who plan to practice engineering in an industrial setting, as opposed to typical Ph.D. programs that are aimed at future researchers and educators. It includes a required business component taught by the university's management faculty.

The approach the university took in designing this business component could be used to design a business education program for IS professionals. This design is based on three eminently reasonable assumptions:

1. That high-level engineers can benefit from understanding the business environment in which they work.
2. That these students bring to the program distinctive competencies that can and should be reflected in the program design.
3. That, given these competencies, the limited aims of the pro-

gram — which are less than a full graduate education in management — can be achieved in a fraction of the time required for an MBA.

Program tailoring

Engineering doctoral candidates are not systems developers. But their backgrounds and needs have a lot in common. It is possible to design a program of a half-dozen courses or so to introduce IS professionals to the way business, the economy and the marketplace function. Much material can be adapted from existing MBA courses.

Universities will not grant a master's degree for six courses. A "Certificate in Management Studies" is a reasonable possibility. But the value of such a program is not in the piece of paper that its graduates receive.

If industry truly does need IS professionals with improved business focus, such a program would satisfy a real need cost-effectively and time-effectively. Its graduates, if they are truly what management wants, will perform better on the job. They will be rewarded with above-average raises and promotions. Their employers will be rewarded with more productive employees. Those are more important than the wording on a piece of paper.

Mallach is a faculty member at the University of Lowell in Massachusetts and a consultant to users and vendors.

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CW

SYSTEMS & SOFTWARE

HARD TALK

Rosemary Hamilton

IBM saps user power



The IBM Corporate Service Amendment (CSA) price limits, important clauses that give users the option to break their CSA contracts, have been changed.

But this isn't news to anyone who read the very bottom of a notice IBM sent out to customers several months ago.

The notice went out along with the Serviceplan introduction. Serviceplan is IBM's new approach to maintenance services that tucks everything into a neat package. The intention is to make maintenance administration easy for customers.

Sometimes IBM doesn't provide all the details of an announcement to the press. Occasionally, little nuggets of information are buried in notices that go only to customers. And sometimes those nuggets can make a big difference to some customers.

This particular CSA nugget was the last item in a list of seven changes that would be made to IBM service offerings along with the Serviceplan introduction. Most of the seven were included in material sent along to the press. The seventh was not.

Continued on page 28

DB2, IMS look at coexistence

ANALYSIS

BY STANLEY GIBSON
and JEAN S. BOZMAN
CW STAFF

A conversion from IBM's IMS to DB2 is so fraught with difficulty that IBM is currently not venturing to provide conversion aids.

The difficulty arises because IMS data structures must be "flattened out" — not an easy transformation — for use in DB2, according to IBM Santa Teresa Laboratories designers.

"We are encouraging third-

party service providers to develop tools that will assist in conversion to DB2," said Norris van den Berg, IBM's manager of data systems architecture and strategy, in a recent briefing.

But IBM is offering some coexistence aids and plans more. As a first step, IBM is shipping a DXT product that allows data extraction from IMS to DB2 during periodic, or batch, updates. Products that support real-time updates and DB2 conversion are still under development, Santa Teresa managers said.

IBM is planning products that

will allow IMS data to "propagate" to DB2 on a real-time basis, van den Berg said. With propagation, users can keep data consistent between IMS and DB2. "It enables a customer to define a mapping relationship between an IMS DL/I segment and a DB2 row," he said.

Propagation, with full support for commitment, recovery and performance, is destined to be in future IMS and DB2 products, van den Berg said. "It's a very important requirement, but we won't say when it will be available in product," he said. "We're

very anxious to get it out as soon as possible."

Under the propagation plan, real-time IMS transactions such as a bank transaction at an automated teller machine would automatically be mapped into DB2's row-and-column architecture. But before propagation can be shipped in an IBM product, IBM designers will have to work out "two-phase-commit" features between IMS and DB2. Two-phase commit is expected eventually in DB2.

Customer councils that give Santa Teresa planners feedback on product strategy have already shown that such IMS-to-DB2 real-time updates may only

Continued on page 26

Three Amdahl models invigorate 5990 series

BY J. A. SAVAGE
CW STAFF

SUNNYVALE, Calif. — Claiming the biggest uniprocessor mainframe to date, Amdahl Corp. introduced it and two other models recently in giving its 5990 series a midlife kicker.

The new uniprocessor, the Model 350, is said to run at 35 million instructions per second (MIPS). It has a bit more than half the performance of the 1-year-old Model 700 dual-processor mainframe, according to Chuck Fomer, Amdahl vice-president of system marketing.

Until last week, National Advanced Systems claimed that its AS/EX 60, which runs at about 27 MIPS, was the largest uni-

processor available.

Uniprocessor users such as Keith Butler, vice-president of information services for The Franklin, a life insurance company in Springfield, Ill., would be the likely target of Amdahl's 5990 Model 350. But Butler said he is in no hurry to switch.

"We're a uniprocessor shop [with an Amdahl 5890 Model 180], but it will be at least five years before we're likely to get a larger mainframe," Butler said.

The other models fill in mid-range gaps in Amdahl's 5990 line. The Model 500 is a dual processor running about 44 MIPS, and Model 1100 is a three-way multiprocessor running approximately 91 MIPS.

"Amdahl made it clear they

will enhance both [the 5990 and the earlier 5890 series] lines," said Bonnie Digrius, an analyst at San Jose, Calif.-based research firm Infocorp.

Amdahl also enhanced its Multiple Domain Feature, which gives users the ability to partition a mainframe into several systems with the capacity to run

different operating systems simultaneously. The feature was increased from four to seven domains on the 5990 dual processor and from eight to 14 partitions for multiprocessors.

Availability was slated for late last month for the Model 350 and this month for the other two models.

Midlife transfusion

Amdahl filled some gaps in its 5990 series with these new options

	Model				
	350	500	700	1100	1400
Number of CPUs	1	2	2	3	4
Configuration	Single	Dual	Dual	Multiple	Multiple
MIPS*	35	44	63	91	113
Entry-level price	\$3.8M	\$4.6M	\$6.4M	\$9.9M	\$11.9M
Price/MIPS	\$108,000	\$105,000	\$102,000	\$109,000	\$105,000

* Gartner Group, Inc. estimates
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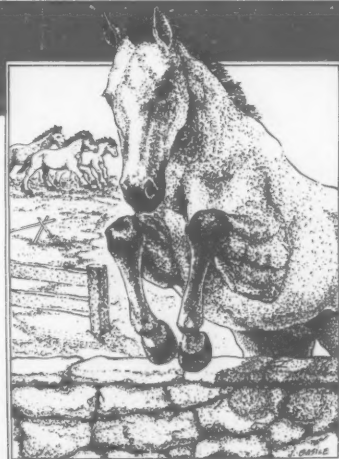
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 B. Microcomputers/Small Business Computers
 C. Microcomputers/Desktops
 D. Communications Systems
 E. Office Automation Systems
 F. No Computer Involvement

- 1. BUSINESS/INDUSTRY** (Circle one)
 10. Manufacturer (other than computer)
 20. Finance/Insurance/Real Estate
 30. Medicine/Law/Education
 40. Wholesale/Retail Trade
 50. Business Service (except DP)
 60. Government — State/Federal/Local
 65. Communications Systems/Public Utilities/Transportation
 70. Mining/Construction/Petroleum/Raffining/Agric.
 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
 85. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting
 90. Computer Peripheral Dealer/Distributor/Retailer
 95. User/Other _____
 (Please specify)

- 2. TITLE/FUNCTION** (Circle one)
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 18. Vice President/Asst. VP
 21. Dir. Mgr. Suprv. IS/MIS/DP Services
 22. Dir. Mgr. Suprv. of Operations, Planning, Adm. Services
 23. Dir. Mgr. Suprv. Analyst of Systems
 31. Dir. Mgr. Suprv. of Programming
 32. Programmer/Methods Analyst
 35. Dir. Mgr. Suprv. QA/WP
 38. Data Comm. Network Systems Mgt.

- OTHER COMPANY MANAGEMENT**
 11. President/Owner/Partner/General Mgr.
 12. Vice President/Asst. VP
 13. Treasurer/Controller/Financial Officer
 41. Engineering/Scientific/R&D Tech. Mgt.
 51. Sales Mktg. Mgt.

- OTHER PROFESSIONALS**
 66. Consulting Mgt.
 70. Medical/Legal/Accounting Mgt.
 80. Educators/Journalists/Librarians/Students
 90. Others _____
 (Please specify)

- 3. COMPUTER INVOLVEMENT** (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor, or consultant:
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 B. Microcomputers/Small Business Computers
 C. Microcomputers/Desktops
 D. Communications Systems
 E. Office Automation Systems
 F. No Computer Involvement



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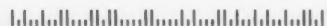
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SOFT
TALK

Thomas O'Flaherty

An AI lesson
for CASE

Computer-aided software engineering (CASE) is at a crossroads: Will CASE fulfill its promise of revolutionizing systems development or merely be an interesting technical tool with marginal impact? The CASE community, both users and vendors, should draw lessons from what has happened to artificial intelligence.

AI is the "productization" of academic research. Certain early uses caught the public eye, such as automated "physician's assistants" for diagnosing diseases or the ability to capture knowledge of technical specialists. These applications are relatively obvious. Beyond that, the AI vendor position was essentially, "Here's our tool, use it."

Real life has proved that most potential AI uses are intertwined with general business or technical problems. The analysts who try to solve such problems often do not understand where AI tools should be applied and certainly do not know how to use them. AI vendors have generally done a poor job of sensitizing the MIS community to how AI tools can be applied to business problems.

Spurred by the realization that AI tools have become virtual commodities, the remaining AI product vendors have begun to use the words "service" and "solutions."

However, getting mileage out of AI means understanding a

Continued on page 29

Bank finds imaging
system pays its way

ON SITE

BY ROBERT MORAN
CW STAFF

NEW YORK — How many employees would it require and how long would it take them to process and review 150,000 mortgages, each consisting of about 10 pages, without the help of technology?

W. Moss Brown doesn't know, and he doesn't have to. Brown, senior vice-president of the capital market products division in the corporate trust and agency group at Bankers Trust Co., based here, heads a division that handles such a work load. A handful of employees use a File-net Corp. imaging system that the bank tied to an IBM 3090 Model 200E mainframe.

The system is used to safeguard mortgage collateral and

monitor due diligence of payments — an essential part of the division's business. Duties include warehousing mortgages, monitoring transfers and keeping records as bonds are bought and sold. Brown's group reviews individual mortgages on behalf of firms that issue mortgage-backed securities.

Brown wanted an integrated system that would provide multiple users with access at different locations in the division's downtown Manhattan offices. "We wanted to get away from the process of physically handling and routing paper throughout the organization," he said.

About two years ago, the division began searching for an imaging system. Although image processing had been part of continuing research and development in the bank's technology strategic planning group, at the

time the bank did not provide for it in the architecture, which consisted of IBM mainframes and Digital Equipment Corp. computers for distributed processing. The technology group, according to Brown, "saw the opportunity to bring imaging into the bank and provided the division with consulting support and seed money."

The investment was in excess of \$1 million for both hardware and software development. The system consists of 11 integrated File-net workstations — four of which are used for scanning when not used for retrieval — one laser printer and one 200-slot jukebox, now about one-third full, that can store six million to 10 million images, depending on their size.

The application required two areas of customization and took six months to complete. A soft-

ware developer built an IBM CICS-based application that runs with Mantis, a fourth-generation application development system from Cincom Systems, Inc., to hold an index of images on the mainframe.

The bank also customized File-net's Workflo, proprietary software that manages the

movement of images from workstation to workstation, to automatically update the mainframe index when the system captures an image.

Now, the division receives loan schedule tapes from its clients, from which it culls the index information it requires and posts the schedule in the loan master on the mainframe.

Brown described the system as a multilocation process. The actual mortgages are given identifying numbers and scanned into

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Bankers Trust's
Brown sped up routing

Intelligent controller debate rages

ANALYSIS

BY J. A. SAVAGE
CW STAFF

The question of whether to position intelligent controllers in front of disk drives is creating a frenzy among vendors and users. It also could be a nail in the coffin of plug-compatibility.

The dispute over where intelligence should reside is building as Amdahl Corp. promotes its intelligent storage processor, a CPU-like controller that handles advanced storage functions with little help from the host.

"At what time [do users] care? We've been moving away from plug compatibility to system compatibility for a while,"

said Louise Biggs, an analyst at San Jose, Calif.-based Dataquest, Inc.

The first move away from plug-compatibility was in direct access storage devices (DASD), which are no longer interchangeable on a string with IBM DASDs. "With controllers, we're seeing it move up a notch," she said.

Intelligent storage devices could be a way for plug-compatible manufacturers to implement system managed storage (SMS) — the steps toward automating storage management across all devices from tape to cache — before IBM reveals how it will accomplish the task itself.

A cacophony of claims and counterclaims is inundating con-

sumers with information about the role of intelligent and dumb storage devices. At least one major player, National Advanced Systems (NAS), is unclear on its own devices' position against those of Amdahl.

Amdahl launched the intelligent controller craze a year ago with the introduction of its Model 6100. The controller, which has up to 37 microprocessors, is intended to offload much of the work of automated system managed storage from the mainframe.

Andor Systems, Inc. in Cupertino, Calif., may be next to offer an intelligent controller. According to its President Gene Amdahl, the company's CPU will first be used in a storage device

with a small footprint and later in a low-end mainframe.

Unlike Amdahl, however, Andor will not be putting in the functions before IBM, but the capability to match IBM's moves will be there, Amdahl said.

NAS is attempting to remain more true to IBM plug-compatibility, according to Joe Burson, manager of worldwide marketing.

NAS has no plans at this time to deploy an intelligent storage processor because, Burson said, that would not be plug-compatible with IBM's MVS/ESA operating system and its SMS on a DASD level. In other words, NAS still intends a user to be able to switch between its 7980 and IBM's 3990, although when one gets to the DASD, the device strings are no longer inter-

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Cyber users anxiously watch CDC

Fear restructuring will have broad impact

BY ELLIS BOOKER
CW STAFF

The 34 or so users of the discontinued ETA10 supercomputers are not the only ones rethinking their computing strategies after the recent announcement that Control Data Corp. is restructuring its computer business.

A number of CDC's Cyber mainframe customers last week said they are worried that CDC's \$490 million restructuring plan, which included the closing of the ETA Systems, Inc. subsidiary, might touch them, too.

Virtually all said they were

concerned about the impact of CDC's plan to slice 3,100 people from its worldwide operations, including its Cyber field service operation.

"We asked where the cuts would be, and all they told us was our level of support would not be affected," said Larry Beckner, manager of information systems at the Garrett Engine Division of Allied Signal Aerospace in Phoenix. Beckner said his operation uses two Cyber 990s, a 930 and an 830 but that it also uses Digital Equipment Corp. equipment and could turn to DEC for its future scientific computing.

Walter McRea, director of the University of Georgia's Advanced Computational Methods Center in Athens, Ga., said his concerns about CDC's "long-term viability" predated the April 17 announcement of the closing of ETA Systems.

"I, at least, generally felt a sale or a dramatic alteration in their investments was likely — and I looked forward to it," McRea said, but added that he was surprised that ETA Systems and its product line were disappearing rather than being sold.

The university will have another vendor for its high-end vector computing within eight or nine months, according to

McRea. McRea also said the university is returning to CDC the air-cooled ETA10Q-216 that it began beta testing in December as a replacement for the Cyber 205. The plan is still to replace the Cyber, however.

Reason for concern

In addition to its two Cyber 205s, the university has several Cyber 180s, and McRea mentioned he was "very concerned with respect to the lower end Cybers participating" in CDC's future product line.

Regarding CDC's planned staff cuts, McRea noted that the Minneapolis-based company had already cut its support staff in the Southeast "dramatically" during the past 18 months.

At the John von Neumann Na-

tional Computing Center, run by the Consortium for Scientific Computing, Inc. in Princeton, N.J., the entire hardware strategy, supercomputer and mainframe computer have had to be revised in light of CDC's recent announcement.

The center, which operates two Cyber 205s and had begun testing ETA10E nitrogen-cooled machines as an upgrade, will likely pick another vendor very soon, a spokesman said.

Looking on the positive side, Beckner speculated that the end of the financial strain caused by ETA Systems, coupled with CDC's stated desire to refocus on its mainframe line, could be good news for Cyber customers. "But we're just waiting to see," he said.

Wang enhances low-end mini line

BY ROSEMARY HAMILTON
CW STAFF

LOWELL, Mass. — Wang Laboratories, Inc. spiffed up its low-end VS 5000 minicomputer series last week by doubling the number of users the four-model line can support.

But the additional support will cost new users of the higher end VS 5000s. The Model 50's operating system, which had an annual license fee of \$1,860 and supported up to 32 users, will now be licensed for \$4,340 and offer support for up to 96 users. The Model 60 operating system's li-

cense is now \$10,230 and supports up to 128 users. Previously, the operating system, which supported up to 64 users, cost \$4,030.

Existing users have the option to expand their systems free of charge, according to Ian Adam, the company's director of

worldwide product marketing. Adam said an operating system enhancement will begin shipping in June.

Wang did not change prices on the lower end Models 30 and 40. The Model 30's user support had been expanded earlier this year from six to 10. The Model 40 was enhanced last week to support up to 64, instead of a maximum of 16.

For low-end minicomputer sales, the VS 5000 goes up against IBM's Application System/400 and Digital Equipment Corp.'s Microvaxes, both of which give it tough competition. But Adam said the company considers the VS 5000 a big success so far. Since the VS 5000 introduction in September 1988, the company has shipped 4,000 systems, according to Adam.

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DB2, IMS

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be needed for 10% of all data a customer may have in IMS. The propagation system, therefore, is not intended to duplicate all data from IMS to DB2 when the two systems coexist.

Meanwhile at least one vendor, Bachman Information Systems, Inc. in Cambridge, Mass., has introduced an aid to migration that can transform an IMS database structure into a DB2 structure. Version 2.1 of the Bachman/Re-engineering Product Set, which runs on an Intel Corp. 80386-based personal computer running MS-DOS, provides a database designer with data descriptions for a DB2 relational database memory system.

After those descriptions are obtained, data can be moved using the IBM DXT product. After that, the programs themselves must be rebuilt, according to Charles Bachman, founder and chairman of Bachman.

Crippling effect

Some are skeptical of this approach, however. "You should look at it as a new application. Why do you want to convert it and end up with a cripple" that doesn't take advantage of DB2 features? asked Jack Olson, product architect of DB2 products at BMC Software, Inc. in Sugar Land, Texas.

One user, Jerry Lindgren, director of information services at wire and cable manufacturer Anixter Brothers, Inc. in Skokie, Ill., is moving parts of IMS databases to DB2.

"We're very enthusiastic about DB2," said Lindgren, who is building an inventory inquiry system under which a sales representative can find products in the inventory based on customer-suggested characteristics.

Having had DB2 for only one year, just 2% to 4% of Anixter Brothers' work is under DB2, but in seven years, the total could be 80%, Lindgren said.

The territory he is exploring in migrating is so uncharted that he gets little help from anyone, including IBM.

"When problems do come up, you can't stop with IBM's first answer. They say wait for the next release, but there are things you can do now," Lindgren said.

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Controller

FROM PAGE 25

changeable. NAS intends to mimic IBM and have its storage controllers run directly by the CPU, at least in the short term.

Amdahl is trying to predict what IBM will do with SMS by programming its controllers to simulate SMS qualities such as dual copy and fast write. Those functions will be offloaded from the CPU to the controller.

No waiting

Amdahl introduced the 6100 because the standard mainframe architecture is headed toward storage management in a device-independent format, according to Al Richard, manager of storage system marketing at Amdahl. Through the 6100, Amdahl can get storage management functionality without waiting for IBM to lead the way. Amdahl's system is compatible only at the interface level.

"Amdahl's approach is ahead of the market, but it's clearly the direction of IBM," said William Husband, senior consultant at Meridian Leasing Corp. in Deerfield, Ill. "Soon your disk controller will look like a CPU with its own operating system, memory channels and some imple-

mentation of RISC for DB2."

Husband cautioned that intelligent controllers, in addition, represent another move toward proprietary architecture. "It will become extremely difficult to disengage from a vendor," he said.

Despite its protests, analysts

think NAS will move toward intelligent controllers in the future, following a move by IBM to a dual-bus architecture. IBM has yet to announce such a product, as it would make obsolete its current line of 3990 controllers that depend on the CPU for instructions.

Users on storage

It's not only vendors that disagree on how intelligence should be added to storage management. Users hold their own diverse opinions.

Bill Anderson, senior vice-president of technology at Seafirst Bank, Inc. in Seattle, said he sees little need for an intelligent processor to handle SMS.

"I see the role of the CPU changing," Anderson said. "It wouldn't surprise me in the slightest to see special activities like storage management unloaded on specific processors in the CPU. If you go the Amdahl route, you have to build a box just for the SMS function."

Richard Lester, vice-president of corporate development at Associated Grocers, Inc. in Seattle, considers intelligent controllers "exotic." There is still a long way to go before the economics move to a point at which a grocery company can take advantage of them, he said: "For the amount of capital investment required, you can buy a lot of disk or hire a lot of people."

Frank Erbrick, vice-president of information services at United Parcel Service, Inc. in Paramus, N.J., is installing IBM MVS/ESA on two IBM 3090 Model 600Es: "System managed storage is a benefit, but it's still a by-product of MVS/ESA."

J. A. SAVAGE

Hamilton

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Previously, a CSA agreement carried a 3.5% total upper limit, meaning that if the total contract cost was boosted by more than 3.5% annually, then the customer had the right to withdraw from CSA without a penalty charge. CSA also had a per-machine upper limit that gave the customer the same right of withdrawal if the maintenance charge on an individual machine was increased by more than 7%.

With the Serviceplan announcement, however, IBM increased the total contract price limit to 5% and eliminated the per-machine price limit.

On the surface, this doesn't seem like a big deal. But it can be a big deal because it gives IBM more flexibility in how it prices maintenance on particular machines. And that gives users less of a say in how maintenance is going to be priced.

Without a 7% per-machine price limit, IBM could increase its prices by 10% or more in an annual period, and the customer no longer has the right to cry foul.

IBM could also cut maintenance charges on other systems

to balance big increases. It could juggle the individual machine maintenance charges so that the overall contract price doesn't exceed the 5% overall contract upper limit. In other words, IBM has a lot more leeway to change maintenance prices while still holding up its end of the bargain.

According to one maintenance consultant, though, IBM didn't always hold up its end of the bargain anyway. Last year, IBM, with two maintenance price increases on its 3080 mainframe, exceeded the 7% per-machine upper limit, according to Donald Goodspeed, vice-president of service and maintenance strategies at the Meta Group, Inc. in Westport, Conn.

But Goodspeed said that few customers bothered withdrawing because of this. The amount of paperwork and effort involved in exercising this option is just too much to make it worth the effort, he said.

Maybe so. But it doesn't so much matter that few people used the withdrawal option. What matters is it's a bit of power that IBM has taken away from the customer, and that's nothing to dismiss.

Hamilton is *Computersworld's* senior editor, hardware.



MIS Operations – 7:06 PM

Imaging

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the system in large batches of perhaps 100 mortgages at a time. Although the actual paper documents will rarely, if ever, be referred to again, they are stored off-site to satisfy legal requirements. "We also burn a second optical disk and store it off-site as a backup," Brown said.

With digitized images of the mortgages captured on optical

disks, the documents are transmitted over an Ethernet local-area network to another location in the building for the review process. There, reviewers segment workstation screens and compare the mortgage loan, the promissory note and the main-frame-based loan schedule. When the system bogged down because users were simultaneously scanning and fetching documents, FileNet added a prefetching algorithm.

Mortgages that fail review or

have missing information are routed to a queue to await additional information. When the information to satisfy exceptions arrives, it is given an identifying number, scanned and stored on different disks from the mortgage applications. The main-frame index automatically ties together information from the unrelated disks, Brown said.

The success of the imaging system has changed the relationship of Brown's division to the corporate trust and agency

group. Now regarded as imaging gurus, Brown and his department members increasingly brainstorm with other divisions to discover ways for imaging technology to help them do business differently.

Brown cautioned that imaging systems are not appropriate for all applications and that prospective users should avoid being blinded by the lights. "Imaging technology is expensive," he said, "but it can pay off with a high return on investment."

Copyright regulations revised

WASHINGTON, D.C. — The U.S. Copyright Office recently issued two new regulations affecting computer software.

According to a regulation issued March 31, software companies registering their source code at the U.S. Copyright Office may block out lines of code that constitute trade secrets. However, the agency warned that "an appreciable amount of computer code" must remain unblocked so that examiners can determine whether the copyright registration is valid.

In another ruling, the Copyright Office tackled the question of how to provide copyright registration for an on-line database.

In a March 31 regulation, the agency said that printouts of an automated database and its revisions may be submitted every three months, under an experimental group registration procedure. A sufficient number of the revisions must be marked to show that the revised database is a new work of authorship.

CASE

FROM PAGE 25

vertical market of industry and, often, a particular company's operations. AI firms have been too small and too technically oriented to accumulate this kind of expertise.

With hindsight, we can see that the AI market has been held back by the following interrelated factors:

- Its technically driven origins — often to the exclusion of a market orientation.
- Product enhancements that led to product convergence or "commoditization."
- Tools that are only part, arguably a small part, of most cus-

tomers solutions.

• The inability of product developers to offer complete solutions — that is, design and implementation.

In much of the prior discussion, "AI" could be replaced by "CASE." There are more than 100 CASE vendors, virtually all of them with a technical mindset. Even worse, no vendor offers a complete set of tools — the largest omission being the ability to reengineer existing systems. Most offer what might be charitably called "CASE fragments."

Given this background, it is no wonder that so many MIS departments have gone slowly with their CASE implementations and that rosy market fore-

casts have not yet come true.

There is room for a small amount of optimism: The professional service vendors/systems integrators routinely use their own or other CASE tools to build customer systems.

However, these "complete" solutions apply only to a specific project. Major corporations still have to decide how — and whether — they can stitch together various CASE products into workable wholes. Afterwards, they have to worry that the vendors they have chosen will remain in the CASE market or stay in business.

Hopefully, CASE can benefit from the AI experience. Unfortunately, there isn't a great deal that the typical MIS depart-

ment can do except try to make some sense out of the CASE clutter. Most of the responsibility for change will be placed on CASE vendors. For example, CASE benefits should be made concrete and quantifiable, not abstract and philosophical.

CASE vendors have to grow up — that is, put together full collections of tools, at the same time that they grow out, or move from a product to a service orientation. Growing in both directions simultaneously will be difficult. However, the alternative is stagnation.

O'Flaherty is director of research at Broadview Associates, an information technology mergers and acquisitions firm in Fort Lee, N.J.

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CASE Comes of Age at New York Life

"Last year we were happy just to be on the mountain top of it," said Carol Zagorsky of New York Life Insurance, describing the considerable progress the organization has made applying CASE technology to the development of

changes are essential. Information Systems

drawing diagrams and charts. Michael Harris, director, system development practice for management consulting firm DMR Group in Los Angeles, says that one of the greatest benefits Excelerator offers is the ability to perform impact analysis. Once information is entered into the program, making changes is trivial. Harris can enter a change and watch the effects ripple throughout the model in much the same way a spreadsheet user performs a what-if analysis.

DMR has become an enthusiastic Excelerator user, with more than 100 copies of the program. Not only is the program used in all 22 branch offices, copies are transferred to clients upon completion of a project.

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Excelerator at Arco

One Excelerator case study came from Atlantic Richfield Company (Arco). At Arco, most software development for mainframe applications is done using Cobol and the

On a system redevelopment project, Arco reported that systems analysts using Excelerator prepared logical data models of information systems with a 10-to-1 gain in productivity over doing it manually.

Excelerator's implementation management, end users and systems developers thoroughly understand and critique the new features before coding began—while there was still time to make changes easily," he says.

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I/O devices

A 14-in. overscan, multiemulation computer terminal has been unveiled by Liberty Electronics, Inc.

The Liberty 120 stores up to six pages of data and is capable of displaying up to 44 lines, the company said. The unit reportedly offers ASCII, ANSI and personal computer-terminal modes to provide Wyse Technology, Digital Equipment Corp. VT terminal and IBM Personal Computer-compatible emulation capabilities. The product is priced at \$549; deliveries are scheduled for the second quarter.

Liberty Electronics
332 Harbor Way
San Francisco, Calif. 94080
415-742-7000



Liberty Electronics' Liberty 120 14-in. overscan, multiemulation terminal

Intelligent Interfaces, Inc. has announced the Microplot 80B plotter/printer buffer designed for downloading output from Hewlett-Packard Co. 9000 series workstations.

The product reportedly features 8M bytes of memory, diagnostic routines and status display functions. According to the vendor, it is shipped with an operating manual and is priced at \$995.

A one-year warranty is included, the vendor said.

Intelligent Interfaces
P.O. Box 1486
Stone Mountain, Ga. 30086
800-842-0888

A color graphics processor has been announced by Adage, Inc.

The Adage 200 is a host-connected graphics-display device that incorporates a two-board set in 9U VME format, according to the vendor. The system is reportedly contained in a small footprint chassis with a power supply and multiple I/O ports.

The product will be distributed in a variety of configurations, and basic specifications include the following: a noninterlaced pixel resolution of 1,280 by 1,024; 250,000 to 350,000 two-dimensional vectors; second graphics speed; and a 12-image plane.

A math coprocessor and an extended frame buffer are available optionally, the company said.

The product is scheduled to ship in quantity during the second quarter. Pricing will range from \$17,995 to \$29,995, depending on system configuration, according to the vendor.

Adage
165 Lexington Road
Billerica, Mass. 01821
508-667-7070

Four large-format pen plotters developed for computer-aided design (CAD) and project management hard-copy output have been introduced by Bruning Computer Graphics.

The Zeta 924 and 936 are reported to be 24- and 36-in. plotters specifically designed for mechanical, electrical, architectural, engineering and construction CAD. The 924 costs \$5,950, and the 936 model is available for \$7,950.

The Zeta 924PS and 936PS Plotting Stations include all the same features as the previously listed models as well as providing an automatic media feed and take-up stand for unattended roll-feed plotting. They are priced at \$6,700 and \$8,700 respectively, according to the vendor.

Bruning
777 Arnold Drive
Martinez, Calif. 94554
415-372-7568

Dataproducts Corp. has announced five laser font card sets that were designed for applications including bar code and optical character recognition printing, forms creation and presentations.

The font kits are priced from \$175 to \$250 and are designated as follows: the W1 card set; the A,C,L card set; the D card set; the Q card set; and the X card set.

The laser fonts are for use in the Dataproduct's LZR 1200 series, according to the company.

Dataproducts
9657 Mason Ave.
Chatsworth, Calif. 91311
800-423-5095

A full-color thermal dye-transfer printer has been introduced by the Industrial Products Division of Hitachi Sales Corporation of America.

According to the company, the VY-5000 is capable of reproducing high-resolution letter-size hard copies in three minutes.

The unit reportedly was designed to reproduce three-dimensional wireframes, surface-based models and solids generated in computer-aided design and manufacturing environments. It is capable of more than 4M bytes of image data, according to the vendor. Samples will be available in May.

The VY-5000 will carry a price tag of \$18,950.

Hitachi Sales
401 W. Artesia Blvd.
Compton, Calif. 90220
800-262-1502

Unisys Corp. has unveiled a 92 page/min printer for its 1100 and 2200 mainframe computer users.

The EPS9290-90 electronic printing subsystem is aimed at end users with high-volume print requirements of up to 2 million pages per month, according to the vendor.

The device reportedly is based on a proprietary intelligent controller and offers a 300 by 300 dot/in. resolution. Features include dual-page output hoppers, collated output, job separation and image rotation.

The system is shipped with a Basic Font Library and a single-bin output stacker and is priced at \$200,000, the vendor said.

Unisys
P.O. Box 500
Blue Bell, Pa. 19424
215-542-5367

Maintenance equipment

Capstone Technology, Inc. has announced a pocket-sized field test unit for IBM 3270 and 5250 terminals and printers.

Pocketscan is for use by test engineers and service personnel and features a 10-key keyboard and a 32-character LCD, the vendor said.

The unit reportedly can test and verify operations of more than 21 different coaxial and twin-axial devices and can be operated with either AC power or an optional self-contained battery pack.

It is priced at \$1,495, according to the vendor.

Capstone Technology
853 Brown Road
Fremont, Calif. 94539
415-438-3500

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Chicago, Illinois

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The new COMPAQ DESKPRO 286e.
Further proof that what's on the outside,



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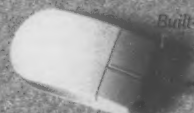
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Built-in VGA graphics run up to 50% faster than other VGA controllers.



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In memory, one megabyte is standard and is expandable in increments up to 13 megabytes using a separate high-speed memory expansion slot.



This leaves four industry-standard expansion slots open for LAN cards, mainframe links, etc. to customize the COMPAQ DESKPRO 286e to your users' needs.

You can take customization a step further. The COMPAQ



You get the flexibility to use both 5 1/4- and 3 1/2-inch diskette drives, along with a wide variety of high-speed fixed disk drives and tape drives.

DESKPRO 286e can be configured with up to four internal storage devices. Choose fast 110-, 40- and 20-MB fixed disk drives; both 5 1/4- and 3 1/2-inch diskette drives; even tape drives.

As you can see, the new COMPAQ DESKPRO 286e offers the same attention to detail that has made the COMPAQ name unmatched for performance, quality and reliability.

For a free brochure on the COMPAQ DESKPRO 286e and the location of an Authorized COMPAQ Computer Dealer near you, call 1-800-231-0900, Operator 92. In Canada, call 1-800-263-5868, Operator 92.

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NEW PRODUCTS — SOFTWARE

System software

Bos National, Inc. has released a high-level applications executive shell that allows all Bos software products to run under industry-standard Unix, according to the company.

Bos/Apex can be linked to the device controllers under Unix and allows simultaneous running of both Bos and Unix at different screens within a multiuser environment, according to the vendor. The product also provides direct data interchange capabilities and is priced at \$12,000 for up to 12 screens and \$2,400 for up to 40 screens.

Bos National
2607 Walnut Hill Lane
Dallas, Texas 75229
214-956-7722

Enigma Logic, Inc. has released Version 3.5 of its Unix-Safeword software.

The package runs on a variety of Unix-based systems and has reportedly been evaluated by the National Computer Security Center as meeting the specifications of the Department of Defense Trusted Computer System Evaluation Criteria for identification, authentication and audit.

The latest release includes an integrated set of master merge (import and export) utilities and enhanced logging of administrative actions, the vendor said.

Pricing is based on number of users and ranges from \$500 for two users on a single workstation to \$33,150 for 1,000 users on a Digital Equipment Corp. VAX computer.

Enigma Logic
Suite 301
2151 Salvio St.
Concord, Calif. 94520
415-827-5707

Theos Software Corp. has announced a companion software product developed to add multiuser capabilities to the Theos 386 multiuser operating system.

According to the vendor, Theos-DOS allows Theos 386 users to gain instant access to thousands of DOS programs previously unavailable to them. These reportedly include programs such as Lotus Development Corp.'s 1-2-3 and Wordperfect Corp.'s Wordperfect.

Theos-DOS runs on any microcomputer supported by Theos 386, such as Intel Corp. 80386-based machines from Compaq Computer Corp., Wyse Technology, Inc. and Convergent Technologies, Inc.

Scheduled for delivery early this month, the product will carry a price tag of \$399.

Theos Software
Suite 360
1777 Botehlo Drive
Walnut Creek, Calif. 94596
415-935-1118

Forth, Inc. has introduced a multitasking, multiuser, real-time operating system for the Harris Corp. RTX 2000 microcontroller.

Called Pfx, the product has reportedly been optimized for real-time control applications in areas such as process control, data communications, robotics and instrumentation. According to the company, the software can run co-resident with MS-DOS on the IBM Personal Com-

puter and the RTX 2000 simultaneously for implementing multiprocessor applications.

Reportedly available now, the product will be priced at \$3,350.

Forth
111 N. Sepulveda Blvd.
Manhattan Beach, Calif. 90266
213-372-8493

Database management systems

A file conversion facility designed for IBM DB2 users has been announced by Carleton Corp.

CQS-Convert2/DB2 reportedly allows users to access information from a combination of any standard IBM file structure and a variety of database management systems including Cincom Systems, Inc.'s Supra, Software AG of North America, Inc.'s Adabas and Cullinet Software, Inc.'s IDMS/R. The information is passed through a user-defined rules base, and the resulting output is written to a DB2 internal format file for import into DB2.

The product is priced from \$9,500 and runs on all IBM and plug-compatible mainframes supporting IBM's MVS/XA operating system environment.

Carleton
8 New England Executive Park
Burlington, Mass. 01803
617-272-4310

Treehouse Software, Inc. has developed a standard auditing capability for Software AG of North America, Inc. Adabas and Natural installations, the company said.

Called Audire, the software is reportedly able to produce multiple reports and output data sets via a single pass over Adabas Protection Logs. Selected fields can be presented on one or more reports, according to the vendor, and analysis can be performed on selected fields to determine changes in value. The product is priced at \$10,000 for all operating systems.

Treehouse Software
Suite 206
400 Broad St.
Sewickly, Pa. 15143
412-741-1677

U.S. Companies Involved In ISDN Trials And Service Rollouts

Company	Switch	Access	Carrier	Status	Note
Aetna, Hartford, Conn.	AT&T SESS	Basic	Southern New England Telephone	Installation underway	
Albany College, Elizabeth	Western EMBD	Basic	Western Bell	Started March 1988, ends 1989	Yes
American Express, Phoenix, Ariz.	AT&T System 85 PBX-ESS	Primary	AT&T	Started July 1987	First customer of AT&T's Primary Rate
American Translink, Jacksonville, Fla.	AT&T System 85 PBX-ESS	Primary	AT&T	Started Dec. 1987	Beta test site for AT&T's Primary Rate
Arizona, State of, Phoenix	Northern Telecom DMS-100	Basic	US West Communications	Started Nov. 1986, officially ended	
Beech Co., Seattle	AT&T SESS	Basic	US West Communications	Scheduled start Nov. 1988	
Cornell Medical University, Pittsburgh	AT&T SESS	Basic		Contract pending	
Chescon Corp., San Francisco	Northern Telecom SL-100 DMS-100	Primary/Basic	Pacific Bell	Installation underway	
Conrad Corp., Atlanta	AT&T SESS	Basic	Southern Bell	Started April 1988	Paying customer
Conrad Data Corp., Minneapolis	NEC NEAX 61E	Basic	US West Communications	Started Nov. 1987, ends Nov. 1989	Test
Duke University, Durham, N.C.	AT&T SESS	Basic	Southern Bell		
Eastman Kodak Co., Rochester, N.Y.	Northern Telecom SL-100 PBXs	Primary		Started Aug. 1988	First Primary Rate using two SL-100s
Federal National Mortgage Assoc., Washington	AT&T SESS	Basic	CAP Telephone	Started June 1988	
First Bank Business Inc., Princeton (current address), Camden, N.J.	Northern Telecom SL-1 PBX and AT&T 4086	Primary	JBK	Unannounced	
Glass Inc., Research Triangle Park, N.C.	SL-1 PBX and DMS-100	Primary/Basic	GTE South	Started June 1988	First Primary Rate/Basic Rate in one trial
Hamline, Rocky Mount, N.C.	Northern Telecom DMS-100	Basic	Carolina Telephone	Scheduled start Jan. 1989	
Hayed Microcomputer Products Inc., Norcross, Ga.	AT&T SESS	Basic	Southern Bell	Started April 1988	Using ISDN to develop ISDN products
Honeywell, Minneapolis	AT&T SESS	Basic	Pacific Bell	Sept. 1987 to Sept. 1988	
Honeywell Foods Corp., Hershey, Pa.	AT&T SESS	Basic	Central of Pennsylvania	Scheduled start Oct. 1988	Will include ISDN satellite transmission
Honeywell Information Systems (Honeywell Bull), Minneapolis	Northern Telecom TMS-100	Basic	US West Communications	Started Jan. 87, officially ended	Applications included database transmission between office and employees at home
Johns Hopkins Medical Center, Baltimore	AT&T SESS	Basic	CAP of Maryland	Contract pending	
Lawrence Livermore Laboratory (University of California), Livermore, Calif.	AT&T SESS	Basic	AT&T Federal Systems		
Lockheed Martin and Space Co. Inc., Sunnyvale, Calif.	AT&T SESS	Basic	Pacific Bell	Started Sept. 1987, ended Sept. 1988	Test
Mass. Institute of Tech., Cambridge	AT&T SESS	Basic		Scheduled October Oct. 1988	Using AT&T SESS as PBX for private network
Marine Air Force Base, Sacramento, Ca.	AT&T SESS	Basic	AT&T Federal Systems	Started Aug. 1988	Model for ISDN deployment at 50 bases
Mathematical Corp., Oakland, Ca.	AT&T SESS	Basic	Western Bell	Started Dec. 1987	
McDonald Douglas Corp., St. Louis		Primary	AT&T	Unannounced	
Microcom Inc., Framingham, Mass.		Basic	New England Telephone	Installation underway	Part of contract contract
Motronics Inc., Schaumburg, Ill.	Northern Telecom DMS-100	Basic	Worldwide Bell	Planning stage	
MMMA, Washington	AT&T SESS	Basic	AT&T Federal Systems		
Nice Corp., Ogden, Utah	Northern Telecom SL-1s	Primary			Telemarketing company using private ISDN
North Carolina State Univ.		Basic			
Northwest Utilities, Hartford, Ct.	Northern Telecom SL-1s	Primary			PBXs in Rocky Hill Ct. and Meriden, Ct.
Pennsylvania, State of, Harrisburg	Northern Telecom DMS-100	Basic	Bell of Pennsylvania	Contract pending	Statewide network with ISDN in Harrisburg
Prest & Whitney, East Hartford, Conn.	AT&T SESS	Basic	SMET		
Prime Computer Inc., Nashua, Mass.	AT&T SESS	Basic	Southern Bell	Started April 1988	Paying customer
Redwood Communication Systems, Richardson, Texas	AT&T SESS with two routers	Basic	Southwestern Bell	Scheduled start Dec. 1988	40 buildings in a campus environment will be linked via ISDN
Shenandoah University, Winchester, Va.		Basic			
Shell Oil Co., Houston	AT&T SESS	Basic	Southwestern Bell	Start Sept. 1988	Plan to use 5,000 ISDN lines
Southern Methodist University, Dallas	Western EMBD	Basic	Southwestern Bell	Started Feb. 1988	
Southwest Services Corp., Miami	AT&T SESS	Basic	Southern Bell	Started April 1988	Paying customer
SSI Corp., St. Paul, Minn.	AT&T SESS	Basic	Southwestern Bell	Started Aug. 1988	Plan to use 5,195 ISDN lines
Tennessee Inc., Houston	AT&T SESS	Basic	Southwestern Bell	Started June 1988	Plan to use 2,300 ISDN lines
University of Arizona, Tucson	AT&T SESS	Basic	US West Information Systems Inc.	Planning stage	Using AT&T SESS as PBX in private network
University of Connecticut, Storrs	AT&T SESS	Basic	SMET		
University of Indiana, Bloomington	Northern Telecom DMS-100	Basic	Indiana Bell		
University of Maryland, College Park				Unannounced	
University of South Florida, Tampa	AT&T SESS		GTE South	Started Oct. 1987	
U.S. Bank of Oregon, Portland	Northern Telecom DMS-100	Basic	US West Communications	Started March 1987	Test
Virginia, State of, Richmond	AT&T SESS	Basic	CAP of Virginia	Started April 1988	
West Virginia University, Morgantown	AT&T SESS	Basic	CAP of West Virginia	Scheduled start Dec. 1988	Plan to use 600 ISDN lines

Note: This chart was compiled by CommunicationsWeek with information provided by Telecom Communications Inc., Edgewater, N.J., as well as from news releases and published reports. Carriers, switch manufacturers and their affiliated subsidiaries are not listed.

ISDN CHART SEPTEMBER 16, 1988

Applications packages

People Sciences, Inc. has announced that its Career Planning Center software is now available to run in an IBM MVS environment.

The package is reported to be an employee career and skills information system that focuses on current and future positions using real skills required for a company's actual job titles. It automatically creates profiles to set standards of performance and skill expectations and also provides mobility options and position searches.

The package carries a price tag of \$85,000.

People Sciences
Suite 360
General Motors Building
9 Sylvan Way
Parsippany, N.J. 07054
201-984-6800

Prime Computer, Inc. has announced that it is reducing the cost of its Personal Machinist software for computer-aided design and manufacturing by 50%. The new pricing was effective as of April 1, the company said.

The software was developed for the shop floor environment, and the Numerical Control/Geometric Construction and Detailing (NC/GCD) package will be reduced from \$11,800 to \$9,100. The price of the GCD upgrade will reportedly be re-

duced from \$8,000 to \$6,750. The price of NC/Microdraft will be reduced from \$9,950 to \$5,500, and the MC/Microdraft upgrade will be reduced from \$8,000 to \$3,950, the vendor said.

Prime
Prime Park
Natick, Mass. 01760
508-655-8000

SAS Institute, Inc. has released a version of the SAS System developed specifically for Prime Computer, Inc. and Data General Corp. users, the company said.

According to the vendor, Release 5.18 of the SAS System is now available for the Primos and AOS/VS operating systems.

The SAS System was designed for data management, analysis and presentation.

It includes integrated modules for data entry, report writing, business planning and a variety of other functions, the vendor said.

The first-year license fee for base SAS software for Prime or DG users ranges from \$1,725 to \$11,500, depending on machine classification.

SAS Institute
SAS Circle
P.O. Box 8000
Cary, N.C. 27512
919-467-8000

Marc Software International, Inc. has introduced a version of the Wordmarc Word Processor package designed specifically for Prime Computer, Inc.'s Prime EXL platform.

According to the company, the software also includes several desktop publishing functions and enhancements for legal document preparation. Versions of the product are also available that run on Digital Equipment Corp. VAX/VMS computers, Sun Microsystems, Inc. workstations and Prime's Primos operating environment.

Wordmarc for Prime EXL is priced at \$895.

Marc Software International
Suite 309
260 Sheridan Ave.
Palo Alto, Calif. 94306
415-326-7511

Computer Associates International, Inc. has announced Release 2.0 of CA-Iss/Three, its integrated capacity management tool that runs under IBM CICS environments.

According to the vendor, the package consists of two major components: the Analyzer and the Capacity Planner. The former has reportedly been enhanced to accept input data provided by CA-Jars/CICS, the company's performance measurement and accounting package for CICS/VS platforms. The Capacity Planner component now includes facilities for evaluating changes on demand on real memory resources, Computer Associates said.

Pricing for CA-Iss/Three ranges from \$20,000 to \$35,000, depending on which options are selected, according to the company.

Computer Associates
711 Stewart Ave.
Garden City, N.Y. 11530
516-227-3300

Systems Effectiveness Associates, Inc. has introduced a computer-aided engineering (CAE) software product.

Ram-Cad reportedly accepts parts lists and bills of material data from a variety of CAE and computer-aided design systems, including those from Apollo Computer, Inc., Viewlogic Systems, Inc., Automated Images, Inc., GE Calma and other vendors. The software program automatically prepares the data for reliability and maintainability analysis processing, the company said.

Ram-Cad runs on IBM Personal Computers and compatible systems and on Digital Equipment Corp. VAX and Microvax II processors under DEC's VMS and Microvms operating system.

License fees for Ram-Cad begin at \$1,000.

Systems Effectiveness Associates
20 Vernon St.
Norwood, Mass. 02062
617-762-9252

The ISDN Scorecard.

As the demand for ISDN grows, so does the number of ISDN suppliers eager to take credit.

But, as you can see by this CommunicationsWeek chart, there is one clear-cut ISDN leader—the company that helped build the standards for ISDN. That company is AT&T.

95% of ISDN lines are on an AT&T 5ESS® switch.

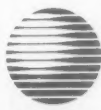
AT&T Network Systems has helped more local telephone companies install more ISDN lines than any other telecommunications supplier—95% of non-trial ISDN lines. What's more, we've already shipped over 200,000 ISDN lines for future use. Today, 99 central offices can offer operational ISDN services over the AT&T 5ESS switch, with a total of 415 upgraded with ISDN software.

So, while other suppliers are still in product development trials, AT&T Network Systems is helping phone companies across the nation offer ISDN services right now on today's network. Services such as simultaneous voice and data transmission, high-speed facsimile and electronic mail all over a single phone line.

ISDN is just the beginning.

We believe that ISDN is the beginning of a bigger future. A future we call Universal Information Services. A future where networks can carry voice, data and image into anyone's office or home at any time in any combination, with maximum convenience and economy.

At AT&T Network Systems, this belief is already driving our technology, our product development and our commitment to you.



AT&T

The right choice.

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Win two ringside tickets to the Leonard/Hearns fight or a TKO Compaq DESKPRO 386/25 PC system! Instantly!

Just go to your participating Ashton-Tate® dealer to enter the dBASE IV™ TKO Sweepstakes. View the dBASE IV TKO Sweepstakes Demo Disk to see if you're an instant TKO Grand Prize winner. At the end of the demo, you'll also get an entry form that you can mail in for a second shot at the TKO Grand Prize or other fabulous prizes.

5 Grand Prizes: An exclusive VIP weekend package trip for two to Las Vegas, including ringside seats to the Leonard/Hearns fight on June 12, 1989 or a TKO Compaq DESKPRO 386/25 PC system with 4 megabytes of internal memory, 60 megabyte hard disk, VGA graphics board and

monitor, and a 2400-baud modem.

There are lots of other exciting prizes.

50 First Prizes: Compaq SLT Portable Laptop PCs (Model 20).

100 Second Prizes: Hard-to-get, easy-to-wear Ashton-Tate dBASE IV TKO jackets.

500 Third Prizes: Free pay-per-view certificates to watch the Leonard/Hearns fight on cable TV.

Early Bird Prize: Two trips for two to either Sugar Ray Leonard's or Tommy Hearns' training camp prior to the fight.

Winner by Technical Knockout.

"It has the most impressive list of features in the database environment."
—DataBased Advisor

"dBASE IV has emerged hardy, healthy and equal to the task of proving itself to the skeptical."
—The New York Times

"If you program in dBASE III PLUS, an upgrade to dBASE IV is irresistible."
—InfoWorld

"dBASE IV offers the most powerful tools for both non-programmers and programmers, and is much easier to use than its competitors... It achieved the only four star rating"
—Software Digest

"It will dominate the MS-DOS and OS/2 database market during the next two years."
—Computer Currents

"Ashton-Tate has done a terrific job with dBASE IV."
—DBMS

"It represents a quantum leap over dBASE III PLUS™ in functionality, power, and ease of use."
—BYTE Magazine

Since its introduction last October, dBASE IV™ has sold over 300,000 copies. In fact, it's one of the fastest-selling new software products in history.

Even faster than Lotus 1-2-3.

And the applause is growing.

From InfoWorld's readers, who named dBASE IV the MS-DOS Database Product of the Year.

From new users, who are finding that dBASE IV's intuitive new Control Center offers a fast and easy way to utilize all its power.

From seasoned users of dBASE III PLUS™, who appreciate the more than 310 new or enhanced commands and functions.



From developers and third-party programmers, who are finding in dBASE IV's Developer's Edition all they need to go from inspiration to application.

And from industry heavyweights, who are hailing dBASE IV as the new world champion in database management.

See what all the cheering is about.

Give us a ring at 800-437-4329 ext. 291. We'll give you more information, including details about upgrading from dBASE III PLUS.

Or simply stop by your nearest Ashton-Tate dealer and see dBASE IV up close. It'll knock you out.

© 1989 Ashton-Tate Corporation. Trademark/Owner: dBASE III PLUS, dBASE IV, Ashton-Tate, Ashton-Tate logo/ Ashton-Tate Corporation. Other product names used herein are for identification purposes only and may be trademarks of their respective companies. Sweepstakes offer void where prohibited. Instant win demo disks available while supplies last. No obligation, no purchase necessary. In the event of a demo disk instant winner, the original TKO Demo Disk must be mailed to FCB/Impact with the completed Instant Win Entry Form to claim the prize. Offer ends 5/31/89. Open to residents of U.S. and Canada (except province of Quebec), age 18 or over. See official rules at your Ashton-Tate dealer for details.

ASHTON-TATE®

PCs & WORKSTATIONS

MICRO BITS

Douglas Barney

Let the Sun shine



In mild praise of Sun, IBM got rightfully slapped around for the proprietary nature of its Micro Channel Architecture, and Apple has lost accounts because the Macintosh is a single-source machine. Now shameless software vendors are getting bashed for closing up their architectures.

But one firm stands apart from this baleful brood of bullies. Sun Microsystems may have an obnoxious yuppie air about it, but it sure knows how to open up a system.

Of course, greed lies at the center of Sun's openness. Sun clones broaden the market (Sun has only sold about 160,000 machines), and healthy license fees finance fancy cars and research and development. But however selfish the motives, opening up an architecture to be cloned is always a good thing.

Sun has already made a few important moves in the name of openness and profit. The Scalable Processor Architecture, or Sparc, chip it developed is available to any and all (not free, of course). Also, it has pegged clone king Phoenix Technologies Ltd. to distribute its entire

Continued on page 41

Battle chips steaming away

RISC and CISC running neck and neck in the microprocessor race

ANALYSIS

BY DOUGLAS BARNEY
CW STAFF

Those in search of blockbusting microcomputer performance just can't lose from the war between newer makers of reduced instruction set computing (RISC) processors and more conventional complex instruction set computing (CISC) chips.

There are two major types of computer central processors. One is CISC, which includes a lot

of information on the chip that the software does not have to contend with. These chips fuel systems such as IBM Personal Computers and Apple Computer, Inc. Macintoshes and run a vast selection of software.

RISC chips contain fewer instructions, which allows them to run a whole lot faster than CISC chips. But because RISC software handles more duties, it requires more effort to create; thus, there is less of a selection, particularly for mainstream business applications.

With either processor type, double-digit millions of instructions per second (MIPS) ratings are either here or are quickly on the way and increasingly affordable at that. The only question is, who will win the race for the fastest, most effective desktop device?

According to analysts, the inherent performance advantages of RISC will keep it in front. Each time CISC systems catch up, the RISC ones will again leap ahead, said Michael Slater, editor of the "Microprocessor Report."

The latest CISC forays include the announcement of Intel Corp.'s I486, which will run at up to 20 MIPS, and Motorola, Inc.'s 50-MHz 68030 and 68040 series, which is expected to reach 15 MIPS, according to the report.

Both the I486 and the Motorola chip are approximately three times as fast as the companies' *Continued on page 42*

Inside

- Database splashes into another league. Page 39.
- Microsoft prunes Mac Excel. Page 39.
- Users still not rushing to buy 386SXs. Page 39.

Borland pulls object orientation into its fold

BY PATRICK WAURZYNIAK
CW STAFF

SCOTTS VALLEY, Calif. — Borland International is planning to take another step soon toward

integrating object-oriented capabilities into its personal computer software applications programs with the inclusion of object-oriented extensions in the next releases of its programming

language products.

In implementing the integration strategy, Borland will bring to its programming languages some of the object-oriented extensions that many see as crucial to making such languages more palatable to nonprogrammers and novices as well as helping to ease the tasks of professional developers.

Over time

During a recent interview, Borland Chairman and Chief Executive Officer Philippe Kahn filled in some of the details relating to the development efforts and added that Borland gradually will introduce several products over the next few years using such object-oriented techniques to foster the goal of end-user programmability.

"We are obviously working

on object-oriented extensions of our programming languages, but we can't say a whole lot more," Kahn said. "It's not a secret that we're working on applying object-oriented technology not only to the programming languages but also in building our applications — new applications using that type of architecture."

With today's users demanding personal computers with graphical interfaces and user-friendly features that are easier to use, other PC software makers are following the trend toward incorporating object-oriented technology into future PC software.

Several Borland competitors working on implementations of such languages include Lotus Development Corp., which has the Lotus Extended Application Facility; Microsoft Corp., which is creating an object-oriented version of its Microsoft Basic

Continued on page 41



Borland International's Kahn outlines plans to make programming languages more palatable to nonprogrammers

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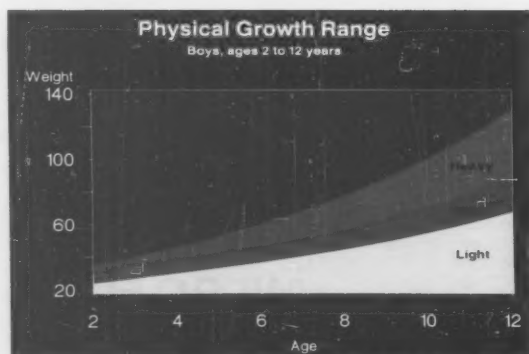
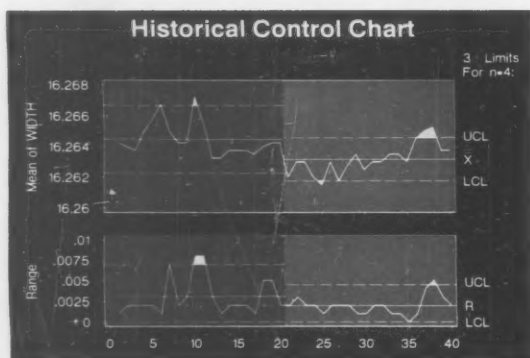
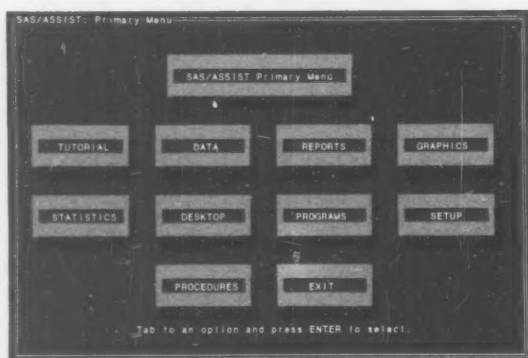
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SMALL
TALK

Michael Alexander

Holding your
end users
accountable

NBC Today host Bryant Gumbel and weatherman Willard Scott finally hung up two

gloves a couple of weeks ago, a long time after the publication of a memo stolen from a file in Gumbel's personal computer. In the memo, Gumbel reportedly castigated fellow Today employees — Scott in particular — about what he felt was an apparent lack of professionalism.

There is a lesson to be learned from the incident that every information service manager should be aware of, says Raymond Humphrey, director of corporate security at Digital Equipment Corp. in Maynard, Mass.: "If you don't want to read it in the morning on the front page of the newspapers, don't leave it resident in your computer, or don't put it in your computer at all."

That's not really a workable approach to computer security for most companies, as even Humphrey will tell you. But I wouldn't be surprised to learn that many top managers are thinking about locking up their systems in copper-lined rooms and throwing away the keys. The steady stream of news reports in recent months, ranging from the shutdown of the nationwide Internet network to the arrest of a computer spy ring in Europe, has given many managers a strong dose of the jitters.

It is difficult to fathom, but

Continued on page 42

Undersea zoning

PC database helps delineate offshore oil rights

ON SITE

BY PATRICK WAURZYNIAK
CW STAFF

HERNDON, Va. — Maintaining a minicomputer-based seismic database to map out detailed points on the ocean floor had become increasingly frustrating for Fred Keer, a geophysicist at the Minerals Management Service (MMS) of the U.S. Department of the Interior, so he and a colleague came up with a better idea.

Keer, a resource evaluation supervisor in the MMS Atlantic Outer Continental Shelf Region office, and fellow MMS scientist B. Johnson designed a personal computer-based replacement for the agency's 7-year-old minicomputer, migrating MMS' mapping application to an IBM Personal Computer AT running Oracle Corp.'s Professional Oracle database.

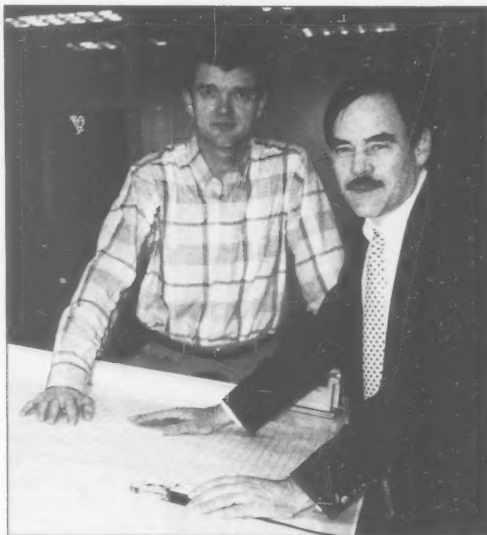
Keer estimated that the

MMS geological and geophysical database and mapping system will save his office — one of four MMS regions of the Interior Department responsible for regulating oil companies' offshore oil drilling activities — about \$50,000 per year on maintenance.

The Atlantic region office uses the application to map the offshore real estate for which MMS sells leasing rights to any oil companies interested in drilling offshore oil wells.

The database's "purpose is to evaluate certain areas, so when the oil companies bid, we know what they're bidding on," Keer explained. "Our biggest concern is to make sure that the taxpayer and the government get a fair market value for their land while at the same time making sure that the environment is protected."

Keer's group currently has 16 PCs in the branch, of which six are dedicated to the mapping



Minerals Management Service's Johnson and Keer built PC-based ocean floor-mapping system

project. The remaining PCs are used for general office and financial modeling, work that in the past had often been done by hand. The actual mapping re-

quires only two Compaq Computer Corp. PCs to run the complex mapping programs — Zycor, Inc.'s Zycor Personal

Continued on page 41

Excel answers challenge
in Mac spreadsheet raceBY JULIE PITTA
CW STAFF

REDMOND, Wash. — In an acknowledged effort to stave off challengers within the Macintosh software market, Microsoft Corp. last week updated Mac Excel, its best-selling spreadsheet package for Apple Computer, Inc.'s Macintosh.

Introduced in October 1985, Mac Excel held almost 80% of the Macintosh-based spreadsheet market last year, according to Infocorp, a Cupertino, Calif., market research firm. However, Informix Software, Inc.'s Wingz, a recently shipped

spreadsheet with three-dimensional graphing and the ability to intersperse graphics with text, has recently captured Mac users' attention.

Philip Welt, group product manager for Microsoft's analysis business unit, conceded that the newest upgrade to Mac Excel is partly the result of competitive pressures coming from Informix. Mac Excel 2.2, priced at \$395, is scheduled for shipment during the second quarter. Current users may update to the new release for \$99.

"Wingz has focused on output and graphics. They've hit us in a place where we haven't moved

our product ahead," Welt said.

While the new version of Mac Excel does not address output or graphics, Welt said Microsoft will address those issues in future releases. Version 2.2 adds new memory-management capabilities that help the package overcome what became known as the 1M-byte barrier. Users have said that memory glitches occur when using Mac Excel 1.5 with Multifinder, the multiuser version of the Mac operating system, unless Excel is loaded before moving into Multifinder.

Jim Hayes, personal computer specialist at Seafirst Bank in Seattle, said the new version has eliminated that. "We had a lot of people building spreadsheets bigger than 1M byte," Hayes said. "Before, it took a lot of creative programming to do that. Now they can do that without hitting any barriers."

Mac Excel shares the same core engine as unreleased versions of PC Excel — Microsoft's spreadsheet for MS-DOS-based systems — and Excel for Presentation Manager for OS/2-based PCs.

Hayes said his firm will stick with Excel. Wingz creates presentations and offers an Apple Hypercard-like scripting language that enhances ease of use when compared with Mac Excel. But Excel — the first spreadsheet for the Mac — boasts a large installed base at the bank.

"Excel is used pretty extensively around here both on the PC and the Mac," Hayes said. "Once you use one package, it can be painful to migrate files to another. But this is still the same Excel; it's not a revolutionary new product. Wingz and Excel were different before, and they're still different."

386SX units log disappointing year

BY JULIE PITTA
CW STAFF

Intel Corp.'s introduction of the 80386SX chip was hailed by personal computer industry watchers because the chip allowed manufacturers to design powerful yet affordable PCs.

But nearly one year after the debut of the first PC incorporating the 386SX chip, users are not rushing to buy SX machines.

"Why would we want a brain-damaged 386?" said Phil Gordon, manager of end-user computing services at Charles Schwab & Co. in San Francisco.

The brokerage firm has no plans to purchase 386SX PCs.

Charles Schwab has standardized on Intel 80286-based systems except for performance-intensive applications, for which it uses 80386-based PCs. "The price/performance curve of standard 386s is coming down rapidly," Gordon said. "Each new manufacturer that introduces a 386 brings downward pressure on prices."

Of the 386SX, Gordon said, "It's an idea whose time has already passed."

According to Bill Lempesis, PC industry analyst at San Jose,

Calif.-based market research firm Dataquest, Inc., about 64,000 of the 386SX-based PCs were shipped last year in the U.S. Lempesis projected that shipments will reach about 770,000 by the end of 1989. That places the 386SX PCs about six months behind the time/sales point that many pundits had predicted for it.

The key selling feature of the new PCs is their ability to use 386 software at prices nearer to 286-based PCs. The chip offers the raw processing power of a 386 but has a 16-bit data path like the lower speed 286. That

narrower path meant that 386-based software would run at slower speeds than it would on a standard 386 system with a 32-bit data path. Although the chip set was originally priced comparable to a standard 386, design costs are lower so that prices for completed 386SX systems were expected to rival those of an IBM Personal Computer AT or compatible.

Compaq Computer Corp., considered the leader in 386 technology, was the first to introduce a 386SX machine, launching its Deskpro 386S last June. Price of the system is \$3,799 for a base model. Since that introduction, other vendors such as Tandy Corp., Dell Com-

puter Corp. and NEC Information Systems have followed suit.

An AT clone today sells for as little as \$1,500. Lempesis predicted that sales for 286-based PCs will peak sometime in 1990. "Their price will be considerably lower than a 386SX," he said.

"At about \$3,000, the 386SX is not the 386 for everyone," he continued. "It would have to drop to the \$1,000 to \$2,000 range for it to really take off." Today, there are few widely used software packages that require a 386, so that users do not see the immediate benefit of migrating to the 386 unless they require speed. The 386SX machines do not offer speed advantages over AT models.

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Barney

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SunOS operating environment, which includes Unix and Open Look. Open Look may still fail against the growing Open Software Foundation/Motif onslaught, but the licensing approach is a healthy gesture.

Unfortunately, Sun still has one proprietary card, or bus, up its sleeve. Its new S-bus cannot yet be licensed. Of course, those who wish to step backward in time can still use the aging VME bus.

Maybe when other firms realize there's money in openness, they'll forget how to be protective. Then we can write nice things about everyone.

Turning around Lotus' nightmare.

Last year, when Lotus executives slept (fitfully, I imagine), frightening images must have been ever-present. "What if

1-2-3 Release 3 is late? What if it doesn't run on an XT? What if people really do fall in love with Windows? What if my daughter marries archrival Philippe Kahn?" In some measure, all of those nightmares except the last have come true. The product was late; it doesn't run on the vast sea of IBM Personal Computer XT machines; and some are starting to adapt to the snazzy graphics of Excel.

But one of the worst catastrophes will actually help Lotus sell its overdeveloped batch of rows-and-columns code. If Release 3.0 had shipped on time last summer and didn't run on XTs, all of Cambridge, Mass., would have been shaking.

The extra year needed to "shrink the code" that still won't work on XTs was a blessing disguised by the worst press in Lotus' history. The installed base and new PC sales have shifted rather dramatically to AT-class machines standard with 1M byte of random-access memory. That makes the Lotus market seg-

mentation theory almost palatable.

To refresh your memory, instead of simply saying that Lotus coders couldn't squeeze Release 3.0 enough, Lotus talked about market segmentation. According to the theory, XTs are a dying breed to be served by Release 2.2; ATs are alive and well and will be served by Release 3.0; and 386 machines with vast amounts of memory will be served just fine by 1-2-3/G. By the time of G ships, this strategy will probably make even more sense.

PR backfire. A public relations bit recently got out of hand—way out of hand. Successful Marketing Strategists came up with a highly unsuccessful strategy that almost got PR idea man Craig Settles in deep, deep trouble. Settles sent members of the press (yeah, we got 'em too) an envelope with no return address that contained an empty shell cartridge and the question "Who is shooting *Computerworld* readers?"

That question disturbed more than a few news hounds. Several magazines called the police. When the second round of mailing went out, one magazine didn't even open the package but called the bomb squad, which X-rayed it.

By the way, the firm being flacked was Foundationware, which is offering a utility to prevent end users from shooting themselves in the foot with mistaken formatting commands and whatnot.

Barney is a *Computerworld* senior editor, PCs & workstations.

Borland

CONTINUED FROM PAGE 37

programming language; and Ashton-Tate Corp.'s development of the Dbase Cross Applications Language.

"It's also quite clear that what is now called end-user programmability is becoming a more important factor in the way that computer users tend to approach their machines," said Kahn, who said Borland first did such an integration of programming into applications in 1985 with the inclusion of macro programming in the firm's Superkey program.

Simplicity and power

Borland's plans for its object-oriented developments include the simplicity offered by Object Pascal, which was developed by Apple Computer, Inc., and the power of AT&T's C++.

Any of the object-oriented programs will be compatible with Borland's existing line of Turbo procedural programming development languages, enabling the reuse of code from earlier Turbo Pascal and Turbo C programs.

"Over the next few years, I think you'll see a rapid switch to the object-oriented paradigm, fueled by the competition between Microsoft and Borland," said Rob Dickerson, Borland's vice-president of product management. "People have this image of languages as being technodweebie, but the reality is that it's cut-throat competitive. It makes word processing look like a picnic."

Undersea

CONTINUED FROM PAGE 39

Computer Mapping System and Rockware, Inc.'s Gridzo Version 4. Those PCs are linked through a local-area network to an AT running Oracle.

"They needed to develop a database in a broad sense of the ocean floor but also with a lot of [specific] physical points such as locations of oil wells that have been drilled," Keer said.

"One of the reasons that we're on PCs is in anticipation of going national, and we didn't want to have to invest in any more minicomputers," Keer added. "People are looking at PCs taking over a larger role, partly because they are inexpensive but also because of the rapidity of development."

Johnson, a scientist and programmer who helped Keer develop the system, said PCs offer cost advantages because of lowered software and hardware costs. Keer said maintenance on the service's old

minicomputer cost \$60,000 annually but added that he expects the annual cost of maintenance on the PCs to be less than \$10,000 per year.

The MMS region has been using PCs alone for about six months after phasing out the minicomputer, a Concurrent Computer Corp. (formerly Perkin-Elmer Corp.) 3200 system.

Since building the database, MMS has seen that such a PC-based system works, and the project is under scrutiny by upper management who, according to Keer, "seem to be looking harder at PCs, how they can be linked into minicomputers on large jobs and maybe use PCs alone."

The scientists looked at other databases, including Ashton-Tate Corp.'s Dbase III Plus, before picking Professional Oracle for its SQL capability and its link to Lotus Development Corp. 1-2-3.

"We use Lotus for number-crunching applications, and you can program with their macro language without being a programming whiz to use it," Keer said. "Lotus is a very good development platform."

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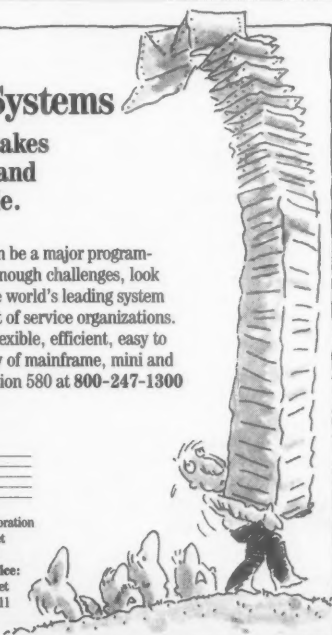
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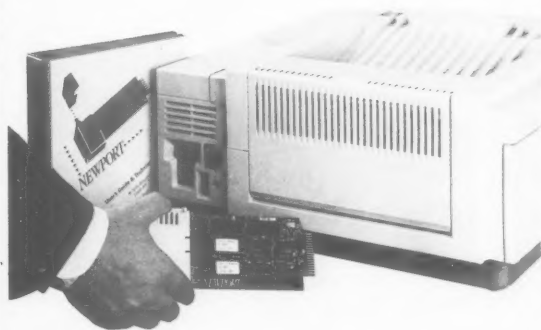
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Battle chips

CONTINUED FROM PAGE 37

previous generation, the report said. However, RISC chips from Mips Computer Systems, Inc. and Sun Microsystems, Inc.'s Scalable Processor Architecture (Sparc) have had this type of performance for two years, Slater said. By 1991, RISC performance will double, leaving users a selection of 30- to 40-MIPS systems.

Fortunately, the war is far from over. Both camps plan dramatic performance gains from multiprocessing. Intel has hooked up with Prime Computer, Inc. to develop a multiprocessing I486 that will speed up to 120 MIPS by the early 1990s, and Sun is still at work on multiprocess-

ing Sparc systems.

Until recently, CISC and RISC have been positioned very differently, with CISC aiming at the mainstream and RISC going for technical uses. That has changed with new generations of affordable RISC and the modified business of workstation vendors. Nowadays, Sun co-founder Bill Joy sees broad use for his firm's Sparc, ranging from laptops to supercomputers. He recently said of today's 12-MIPS Sparc chip that it was the slowest one Sun would ever ship.

Intel and Sun are making similar pitches. Their chips are fast enough to power multiuser systems and workstations but cheap enough for PCs. "There is no architectural difference between PCs, servers and minis," Slater said.

There is more to buying decisions than power. Applications availability also weighs heavily. Here, the CISC architectures have the broadest array of mainstream productivity software. That is expected to remain true for several more years, observers said. Workstations still have the lead in more technically demanding applications such as engineering, design or risk arbitrage. That too is expected to remain true for several years.

While many critics downplay the need for 10-plus MIPS on the desktop, today's operating environments gobble up more than a few cycles. With IBM and Microsoft Corp.'s graphical OS/2 Presentation Manager on the way and Digital Equipment Corp.'s Decwindows, the demands will continue to rise.

Alexander

CONTINUED FROM PAGE 39

most of management's concerns have been directed at protecting a firm's computer systems from outside intruders, even though the greatest security risk is an organization's own employees, as in the "Gumbelgate" incident.

Those responsible for protecting a company's systems from abuse "will have problems in the future that they never dreamed they'd be dealing with," Humphrey warns.

The rate of computer crime is expected to escalate, and protecting systems from abuse, especially by employees, will become even more difficult, several computer security analysts have told me. Personal computers are easier to use and more widely available. End users are more computer-literate, more prone to job-hop and have little opportunity to develop personal loyalties to their employers. Also, few have been adequately taught computer ethics, the analysts point out.

"You'll be dealing with people running their own businesses on the corporate computer, running gambling schemes, posting graffiti, racist or other offensive material and political messages on the computer," Humphrey says.

The trick will be balancing the need to protect corporate assets with end users' need to access and retrieve the information and data contained within the company's data banks easily. Make the system too hard to use, with too many layers of security, and productivity and enthusiasm for work fall dramatically.

Need more than magic

Protecting corporate assets stored on PCs is particularly challenging and requires special measures. At Bell Atlantic, for example, each end user who is assigned a PC, whether a clerk or a chief executive, is given a 90-minute training session on procedures for protecting information, not only after it has been stored in the computer but also when it is in hard-copy form waiting to be keyed into a PC.

Without security measures that go beyond technological fixes, there is about as much security as you would get from a magic amulet, security pros assert.

Top management must also convey to end users that their salary performance reviews will be based in part on the degree to which they have protected the information for which they are accountable.

Proper computer use should be tied to advancement, but accountability must be in a form that is measurable. Responsibility for security should be stated in an annual performance agreement, and the manager should be charged with reviewing that responsibility with the employees who report to him.

End-user computing carries with it a degree of risk, but it has balancing compensations, says Donn Parker, a security expert at management consulting firm SRI International. "There is a potential to apply to the work a discipline that you never had before," he says. With proper training and an emphasis on ethics, end users develop a sense of proprietorship over their work, he believes.

Alexander is a *Computerworld* senior editor, PCs and workstations.



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NEW PRODUCTS

Systems

Tandon Corp. has announced a 32-bit system with reported on-line hard-disk access capabilities of up to 660M bytes.

The Tandon 386/33 micro-computer operates at software-controlled switchable processor speeds of 8 MHz to 33 MHz or 8 MHz to 25 MHz, the company said.

The micro is compatible with all MS-DOS software and comes standard with 1M byte of random-access memory and an IBM Personal Computer AT-compatible 5¼-in., 1.2M-byte disk drive. The system is priced from \$6,199.

Tandon
301 Science Drive
Moorpark, Calif. 93021
805-523-0340

International Software Corp. has introduced the PixC workstation, an Intel Corp. 80286- or 80386-based system that reportedly runs Unix and MS-DOS in separate windows.

The product also offers support for the X Window System and reportedly includes a co-processor board, a mouse and a



Tandon 32-bit micro

monitor, the company said.

Users may run Unix only, MS-DOS only or Unix with MS-DOS as subtasks under Unix, the company said.

The PixC/286 and PixC/386 complete systems come with the user's choice of a Compaq Computer Corp., Tandy Corp. or Wyse Technology personal computer and are priced at approximately \$9,200.

ISC
528 Commons Drive
Golden, Colo. 80401
303-526-0388

Hitech International has introduced a 16-MHz Compaq Computer Corp.-compatible computer.

The SAM3001/381 is based

on an Intel Corp. 80386 micro-processor and operates at 16 MHz, the company said.

The system reportedly comes standard with 1M byte of random-access memory, a 1.2M-byte floppy disk drive, a 200W power supply and a 101-key keyboard. An Intel 80287 or 80387 coprocessor is optional, the company said.

The system costs \$999 and carries a 90-day parts and labor warranty, according to the vendor.

Hitech International
712 Charcot Ave.
San Jose, Calif. 95131
408-435-8827

Software applications packages

Visual Business Systems, Inc. has announced the Beacon II Computer Graphic Software Package, a combination graphics software and driver product for IBM Personal Computer ATs or compatibles.

The product consists of two- and three-dimensional business graphics software for producing bar, line, area and pie charts, the vendor said.

The software package reportedly contains 24 fonts in addition to capabilities for vector painting

and drawing.

The package is offered at a price of \$9,500.

Visual Business Systems
Suite H
700 Lake St.
Ramsey, N.J. 07446
201-327-2526

Klynas Engineering has released Version 3.0 of the company's road-mapping software, called Streets on a Disk.

The package was designed to display street maps on a personal computer and can automatically generate travel directions as well as calculate distance, mileage, travel time and fuel requirements, the vendor said. The latest version reportedly offers support for maps with as many as 500,000 streets and can edit as many as three map files simultaneously. The complete four-disk set is priced at \$150.

Klynas Engineering
P.O. Box 499
Simi Valley, Calif. 93062
805-583-1029

An optical character recognition software package for IBM Personal Computer ATs, Personal System/2s and compatibles has been announced by Inovatic.

Readstar Ex-Press reportedly requires 640K bytes of random-access memory and auto-

matically differentiates between text, graphics, headlines and multiple columns in a single pass, the vendor said. The software is compatible with most desktop scanners, including those from Hewlett-Packard Co. and IBM, and is scheduled to ship in the first half of this year.

Readstar Ex-Press will retail for \$995. For a limited time, current Inovatic Readstar II Plus users can obtain a copy for \$250, according to the company.

Inovatic
Suite 708
1911 N. Ft. Myer Drive
Arlington, Va. 22209
703-522-3053

BTC Enterprises, Inc. has released PCrypto, a software package developed for IBM Personal Computers and compatible systems.

The program reportedly encodes and decodes text files, financial data files, program code files and all ASCII format files for data transmission between locations.

The package costs \$50 per copy, and discounts are available for volume purchases, according to the company.

BTC Enterprises
P.O. Box 2142
Winchester, Va. 22601
703-888-3100



The best route between your Novell LAN and a mainframe is just ahead.

A desktop data analysis and graph-creation software program especially suited for financial and statistical analysts has been announced by Xerox Corp.

Called Xerox Graph, the package runs on IBM Personal Computer ATs, Personal System/2s and compatibles and can produce either color or black-and-white graphics for business reports and presentations, the vendor said.

Values can reportedly be entered in a worksheet of up to 40 columns and 2,700 rows or imported from a variety of common file formats. Scheduled to ship in the second quarter, the product will be priced at \$295.

Xerox
Xerox Customer Support
Center
800-822-8221

Rix Softworks, Inc. has released Version 1.1 of Colorix-VGA Paint, the company's high-resolution IBM Video Graphics Array graphics editor.

The upgrade is available free to all previously registered users of Version 1.0, and enhancements reportedly include the ability to generate ASCII text files from captured graphics screens that contain text. Additional features include full-screen editing and 360-degree

image-rotation capabilities. The product requires 384K bytes of system memory, a VGA graphics adapter and an IBM or compatible personal computer. The program is priced at \$199.

Rix Softworks
Suite 375
18552 MacArthur Blvd.
Irvine, Calif. 92715
714-476-8266

Melissa Data Co. has released PC-Zip, a ZIP code database software package for use on IBM Personal Computers and compatible systems.

The package reportedly provides data on all U.S. Postal Service-approved ZIP codes currently used throughout the country as well as information on time zones and telephone area codes. The program costs \$99 plus shipping and handling and is updated twice each year. Updates cost \$49.

Melissa Data
32118-8A Paseo Adelanto
San Juan Capistrano, Calif.
92675
800-443-8834

Sourcemeat Information Systems, Inc. has released Accountmate Version 2.0 Plus IV, an integrated business accounting software package.

Modules reportedly include

general ledger, accounts receivable, accounts payable, sales order, purchase order, payroll, job cost, fund accounting and consolidated ledger. The 2.0 Plus release was designed to give Accountmate complete compatibility with Ashton-Tate Corp.'s Dbase III Plus and Dbase IV database languages, the vendor said. Single-user modules are priced from \$295 to \$995, and multiuser versions of each module are available for an additional \$200 per package, according to the company.

Sourcemeat Information Systems
20 Sunnyside Ave.
Mill Valley, Calif. 94941
800-877-8896



Sourcemeat Information's accounting software package links fully with Dbase III Plus and Dbase IV

Software utilities

Solana Software has announced Frontend Version 1.0, an add-in tool for Dataease International, Inc.'s application environment.

The software allows any set of keystrokes to be played back when leaving any field on any form or report data-entry screen, the vendor said.

The package reportedly can redefine the bottom command line on any Dataease form or report to become any set of designated characters and can operate in either a stand-alone or networked environment. It is priced at \$300.

Solana Software

324 Shoemaker Court
Solana Beach, Calif. 92075
619-755-7083

Two archival management software products for IBM Personal Computer ATs and compatibles have been announced by Hyperdoc, Inc.

The Architect and Librarian packages are written in C and accept data entered by a mouse, keyboard, scanner or optical character reader, the company said.

Architect reportedly links information through concept association while Librarian is a run-time program that manages and presents data through associative references. The packages are priced at \$1,700 and \$500, respectively.

Hyperdoc
Suite 210
4340 Almaden Expwy.
San Jose, Calif. 95118
408-978-2901

OS/2 software

Symantec Corp. has announced that its Time Line project management software is now available to run under the OS/2 protected-mode operating environment.

According to the company, Time Line OS/2 can reside in

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RabbitGATE's comprehensive IPX/SPX support enhances Novell LANs and gives each workstation about 20kb of memory by eliminating the need to load NetBIOS. IPX/SPX also provides faster, more efficient network routing. And it

enables inter-LAN gateway access—for SNA, BSC, DFT, and X.25 networks.

And RabbitGATE support doesn't end with Novell LANs. It works as well with NetBIOS LANs. And like all Rabbit products, it provides

memory, and schedules can contain as many as 10,000 tasks. Users reportedly can recalculate a Time Line schedule while simultaneously editing a question-and-answer database or printing a report. The product carries a suggested retail price of \$595; current users of Time Line 3.0 may upgrade for \$99.

Symantec
10201 Torre Ave.
Cupertino, Calif. 95014
408-253-9600

Polaris Software has announced an OS/2 Presentation Manager version of its Polaris Packrat personal information manager package.

Packrat currently runs under the Microsoft Corp. Windows environment, and the latest release includes support for multi-threaded operations, according to the company.

Scheduled to ship in May, a stand-alone package will be priced at \$395; a three-user groupware package will cost \$695. A runtime version of Microsoft Windows/286 is included with the Windows versions, the vendor said.

Polaris
Suite 323
613 W. Valley Pkwy.
Escondido, Calif. 92025
619-743-7800

Macintosh products

A handheld scanner for Apple Computer, Inc. Macintosh Plus, Mac SE or Mac II computers is now reportedly available from Thunderware, Inc.

Called Lightning Scan, the device is capable of transferring images up to 4 in. wide onto the Macintosh system, according to the vendor. The product reportedly offers scanning resolutions of 100, 200, 300 and 400 dot/in. and is bundled with a set of editing software tools. The scanner costs \$549.

Thunderware
21 Orinda Way
Orinda, Calif. 94563
415-254-6581

A series of disk drives designed to address the complete Apple Computer, Inc. Macintosh computer family is now available from Tallgrass Technologies Corp.

The 4000 series of 3½-in. small computer systems interface disks reportedly includes both external and internal drives that can be configured with either 40M or 100M bytes of storage.

According to the company, all drives were designed to exceed

30,000 mean time between failure power-on hours. Pricing starts at \$1,095, and the units are shipped with a two-year warranty, the vendor said.

Tallgrass Technologies
11100 W. 82nd
Overland Park, Kan. 66214
800-825-4727

An object-oriented drawing application based on Adobe Systems, Inc.'s Postscript has been announced by Cricket Software, Inc.

Called Cricket Drawmaster, the program was designed for Apple Computer, Inc. Macintosh systems and includes a full set of integrated drawing tools, the vendor said. Bezier shapes can reportedly be created using any combination of pen, polygon and freehand tracing functions. A text processor is also included.

The software requires 1M byte of random-access memory and is scheduled for delivery in the second quarter. It will cost \$295.

Cricket Software
40 Valley Stream Pkwy.
Malvern, Pa. 19355
215-251-0678

Peripherals

A 24-wire dot matrix printer has been introduced by Radio Shack,



Radio Shack's Tandy DMP 300 dot matrix printer

a division of Tandy Corp.

The Tandy DMP 300 features a 10-in. carriage and prints at speeds up to 270 char./sec., the vendor said. The device reportedly emulates the IBM Proprinter X24 and offers standard fonts of 10, 12 and 17.1 char./in. in word processing and data processing modes. The printer weighs 18½ pounds and is priced at \$649.

Radio Shack
1700 One Tandy Center
Fort Worth, Texas 76102
817-390-3700

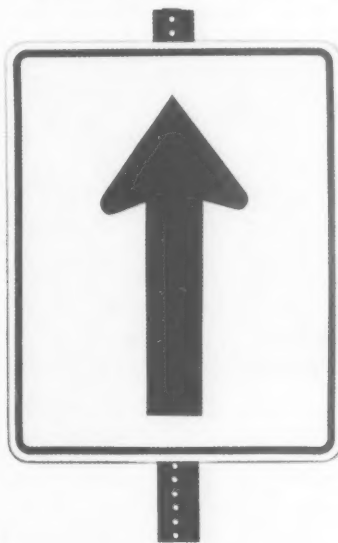
Pencept has introduced a graphics and character entry device developed to increase the efficiency of Lotus Development Corp.'s Freelance III users.

The Penpad digitizer is available in three configurations. The Model 320 incorporates a digitizing stylus or puck, an IBM Personal Computer-compatible interface and recognition board and handprint-recognition capabilities, the company said.

It is priced at \$1,095.

The Model 310 also offers

Continued on page 49



gateway optimized for Novell's IPX.

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continued on following page

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continued from previous page

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Continued from page 45

handprint recognition and was designed for the IBM Personal System/2. The device connects to the computer's serial port and is priced at \$1,395, according to the company.

The Model 300, priced at \$695, is identical to the Model 310 except for the handprint-recognition capabilities.

Pencept

460 Totten Pond Road
Waltham, Mass. 02154
617-890-8877

Kroy, Inc. has introduced a printer and software that allows personal computer users to create laser-quality letters and symbols on adhesive-backed tape, according to the company.

The Kroy Lettercrafter software reportedly acts as a gateway between IBM Personal Computers or compatible systems and the Kroy 360PC thermal transfer-based printer. Users can choose from a variety of typefaces, styles and point sizes for creating labels, the vendor said.

The complete system, including printer, software and cables, carries a price tag of \$2,195. Lettercrafter software may be purchased separately for \$595.

Kroy
14555 N. Hayden Road
Scottsdale, Ariz. 85260
602-948-2222

Prohance Technologies, Inc. has introduced a mouse input device that provides users with a 40-key programmable keypad function, the vendor said.

Called the Powermouse, the product reportedly operates in an IBM Personal Computer, Personal System/2 and compatible environment. It provides preprogrammed definition tables for programs such as Lotus Development Corp.'s 1-2-3 spreadsheet.

Users can also create their own definition tables for pop-ups, macros and a variety of data entry functions, according to the company. Powermouse is priced at \$195.

Prohance Technologies
1558 Siesta Drive
Los Altos, Calif. 94022
415-967-5679

Board-level devices

Micron Technology, Inc. has announced a line of single in-line memory module (SIMM)-based add-in memory boards designed specifically for Compaq Computer Corp.'s 386 computers.

Expanding the company's Ascend family of products, each of the four new boards incorporates 1M-byte SIMMs. Micron's memory board for the Compaq Deskpro 386 can accommodate 4M or 8M bytes of memory. Boards for the Deskpro 386/20E and the Compaq 386S contain room for up to 12M bytes of add-in memory. The units are priced at \$2,999 each and should begin shipping May 15.

Micron Technology
2805 E. Columbia Road
Boise, Idaho 83706
208-383-4000

Everex Systems, Inc. has announced an 8M-byte random-access memory board specifically designed for the 16-bit IBM Personal Computer AT bus.

The RAM 8000 reportedly provides full support in hardware for both extended memory and Expanded Memory Specifi-

cation 4.0.

The board comes standard with no kilobytes of memory and is priced at \$499. As much as 8M bytes of memory can be installed in 2M-byte increments, according to the company.

Everex

48431 Milmont Drive
Fremont, Calif. 94538
415-498-1111

An accelerator card said to provide IBM Personal System/2 Models 50 and 60 with performance comparable to the 20-MHz Models 70 and 80 is now available from Polywell, Inc.

According to the vendor, the Hummingbird 50/60 is a 20-MHz high-speed caching power booster for the PS/2 Mod-

els 50, 50Z and 60. The device reportedly includes an Intel Corp. CMOS 80286 processor chip and 32K bytes of random-access memory. It is priced at \$995.

Polywell

61 C Airport Blvd.
S. San Francisco, Calif. 94080
415-583-1974

Metrabyte Corp. has announced the UCPDISO-8, an IBM Micro Channel Architecture-compatible data acquisition and control board for IBM's Personal System/2 line.

The board is designed for energy management, production test and lab automation applications and includes eight electromechanical relay outputs and eight optically isolated inputs. It costs \$350.

Metrabyte

440 Miles Standish Blvd.
Taunton, Mass. 02780
508-880-3000

Willow Peripherals has announced VGA-TV, an IBM Video Graphics Array (VGA) card that reportedly converts VGA output into a broadcast-quality National Television System Committee signal. It permits personal computer users to view VGA programs or graphics presentations in large-screen television format with resolution of up to 640 by 480 pixels and 256 colors. It costs \$699.

Willow Peripherals

190 Willow Ave.
Bronx, New York 10454
800-444-1585

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NETWORKING

DATA STREAM

Elisabeth Horwitt

It's never too late to learn



It's what graduate school is supposed to be like: The students dress in casual garb, with a liberal sprinkling of jeans and sneakers. They lean forward attentively or lounge back, feet on the table. They often take the conversational ball from the instructor and throw lateral passes around the room, feeding the flow with their own work experiences. They obviously know each other well.

This is the kind of class I observed at the Westchester branch of Polytechnic University's Center for Advanced Technology in Telecommunications. The university is one of several institutions that offers a master's of science degree in either Information Systems Engineering or Telecommunications Management. But its students are not your typical B.A. graduates: they are IS and telecommunications planners and managers, five or 10 years into their careers at Fortune 500 corporations and leading vendor organizations.

The students I talked to were not "volunteered" by their companies. They see the program as a way to further their ambitions, which often extend as far as running or even owning their own companies. The first step toward this goal, they feel,

Continued on page 52

OS/2 makes connections

Business options include links to host, SNA

BY PATRICIA KEEFE
CW STAFF

Ever so slowly, the pieces necessary to propel widespread use of OS/2 in corporate accounts are beginning to appear. The most critical are IBM host and wide-area connectivity, two areas receiving a lot of attention from vendors.

Users who object to IBM's bundled approach — OS/2 Extended Edition with database and communications managers — are now finding they can expect to have at least a few choices.

Only 3Com Corp., with its 3+ Open Maxess line, and OS/2 Extended have begun to deliver OS/2 to Systems Network Architecture (SNA) connectivity, but Microsoft Corp. is close behind. IBM is slated to deliver some enhancements to Extended Edition this fall, while Microsoft, along with development partner Digital Communications

Associates, Inc. (DCA), is planning a fourth-quarter shipment.

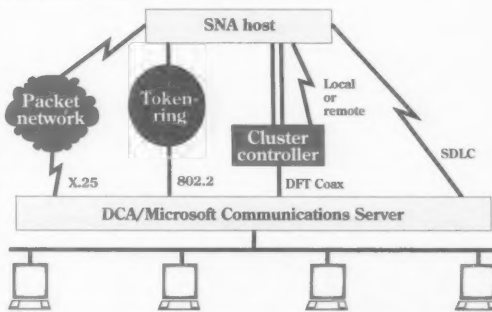
"It became clear when we considered OS/2 and the LAN Manager business overall that WANs were important to our customers," said Adrian King, general manager of Microsoft's Work Group Services division.

Novell, Inc. is expected to further delineate its wide-area strategy when it unwraps Networkware 386 May 8. Banyan Systems, Inc., which said it has delivered integrated SNA connectivity since 1985, expects to deliver OS/2 support in early 1990. Two other vendors that announced plans a year ago to build an alternative communications manager but have yet to deliver are Rabbit Software, Inc. in Malvern, Pa., and AST Research, Inc. in Irvine, Calif.

The DCA/Microsoft Communications Server, or Comm Server, evolved from a similar, albeit less robust, server product announced last spring by DCA.

OS/2-to-SNA options open up

Comm Server is Microsoft and DCA's attempt to offer multiple types of host connections



SOURCE: DIGITAL COMMUNICATIONS ASSOCIATES, INC. AND MICROSOFT CORP.
CW CHART: JOHN YORK

Comm Server, the result of a collaboration among DCA, Microsoft and UK developer Data Connections Ltd., will require OS/2 and LAN Manager and shares the same passwords and user IDs as the LAN Manager.

In addition to the requisite IBM protocol and application programming interface support — that is, LU6.2 and PU2.1,

3270 emulation and Server Requester Program Interface — Comm Server reportedly will enable users to better manage and back up their wide-area networks.

Previously, Microsoft talked about distributed applications only in the context of the LAN Manager, which restricts opera-

Continued on page 52

Switch to local PCs eases Bain data entry

ON SITE

BY ELISABETH HORWITT
CW STAFF

BOSTON — International consulting firm Bain & Co. recently used two off-the-shelf micro-computer packages to solve a mammoth data entry problem that stemmed from the need to collect 50,000 records each month from its sites around the world.

The records, which are primarily logs of consultants' time, expenses and internal charges, are loaded into Digital Equipment Corp. VAXs at corporate headquarters here. Until recently,

the process was anything but streamlined.

Six months ago, data entry clerks on IBM Personal Computers logged onto VAXs directly as terminals. "Users were clamoring for a way to improve response time and reliability and decrease the complexity of the data entry process," said Bart Adler, manager of corporate data processing at Bain.

Bulk rate

Adler, who was a communications analyst at the time, came up with the idea of using the PCs as a local data entry system so that operators would go on-line to a remote VAX only when they

were ready to send multiple records as a bulk transfer. This would cut both telecommunications costs and response time.

What was missing was software to turn the PCs into data entry devices. Among the key features that Adler sought were automatic validation of locally entered data, an automatic method of connecting to the VAXs for bulk data transfer or accessing VAX applications and peripherals and a flexible means for developing PC screens.

Under the old system, entering data from remote sites to the central hosts was a complex, time-consuming and often frustrating process, Adler said.

Inside

- HP/Apollo merger from a fresh angle. Page 58.
- EPA looks into electronic report filing. Page 64.
- Bytex low-end matrix switch out. Page 65.

Bain's corporatewide network has Ethernet local-area networks connecting employees on-site and 9.6K bit/sec. leased lines over distance. Users at a remote Bain office in, say, Paris, typically had to (1) get on the LAN and ask for a remote port connection on a statistical multiplexer that routed them through to (2) the London LAN, where they had to again select a port to (3) a data

Continued on page 60

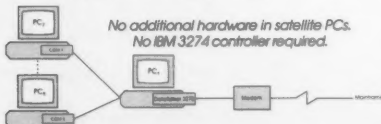
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An Interface Systems, Inc. Company

OS/2

CONTINUED FROM PAGE 51

tion of such an application to the LAN. "What the Comm Server allows you to do is to extend the domain of the application across the WAN," Microsoft's King said.

Among the specific capabilities offered by Comm Server is network management. Users on an OS/2 LAN will be able to exchange messages with Netview, King said, adding, "I wouldn't say we utilized all the functions of Netview/PC." Beyond sending alerts to Netview, the Comm Server can display the average response time and network load factors, information generated by Netview.

Network administrators will also be

able to configure the network from any workstation — for example, plugging in extra servers without taking the network down.

It will no longer be necessary to tie each client to a particular server. Instead, the server, via dynamic routing and load balancing, will advertise its capabilities across the network. Workstation requests will be routed to the appropriate available server. One workstation will be able to have multiple sessions to different servers, according to Microsoft.

Hot backup capabilities will not prevent the server or any related host sessions from going down, but it will allow the workstation essentially to restart the session. "We've adopted the rules defined by SNA networks," King said.

Horwitt

CONTINUED FROM PAGE 51

is to grow out of the niche of a technician or planner responsible for one aspect of computer or communications operations — and that means acquiring skills not only in other technical areas but in financial and business aspects of their organization.

At Polytechnic, telecommunications techies learn about computer architectures and software engineering while IS guys are boning up on tariffs, fiber-optic cable and how a glitch in a T1 switch can affect their computers' response times. They also learn the latest about what is going on in their own areas so, as one stu-

dent put it, they can talk sensibly to young hotshots who just got their computer science degrees.

Also, everyone gets a practical grounding in financial and managerial skills. For example, at the Management of Information Systems course I observed, a speaker was brought in to describe the financial floundering of his now-defunct electronic mail company.

"The classes stress taking a wide stance for the future merging of computers and communications," said Ian Azrikan, a communications planner at Drexel Burnham Lambert. "In order to use the technology, the company needs to know where they are going — the network is becoming the computer."

"I've been 10 years in the industry, and I wanted to know how to better manage technology to gain a strategic advantage," said Yvonne Geter, a communications consultant at PepsiCo.

THE BEST interactions take place not during class but during lunch and the ritualized fruit-and-cookie breaks.

Both programs require students to complete a project that involves their companies' communications or computer systems and generally results in something useful.

Geter's project involved evaluating how to "maximize the effectiveness" of the internal consulting group she works for "in terms of adding business value." The project resulted in a reassessment of the internal consulting function to include aspects of technology planning, as opposed to "heavy project-oriented or development activity," which was its former primary focus, she said.

Azrikan's grounding in networking from the program has already helped him in his job, enabling him to catch a consultant at the game of substituting telecom jargon for a real solution to a problem.

Ariel Kornberg, a senior technical officer at Manufacturers Hanover Trust, signed up for the masters program in IS Engineering to "revitalize my imagination as a systems maker." He was able to use knowledge about packet switching and queuing garnered from one of the courses in a project to measure performance of on-line screen transactions back at work, generating "a wellspring of ideas" on how to boost system performance, he said.

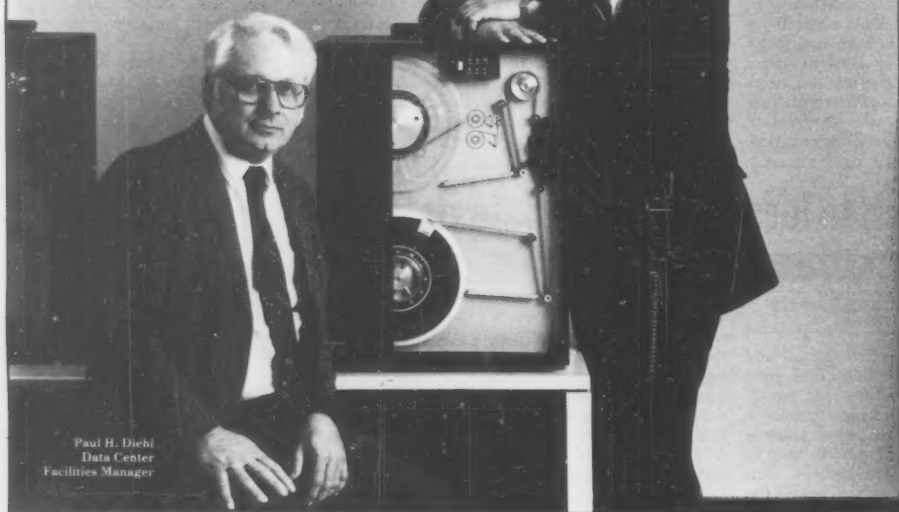
With its fourth class graduating this year, Polytechnic is still fine-tuning its course formats, according to director Ivan Frisch. But there seems little question that the current format works — particularly the content and the strong interaction among students.

The best interactions, students told me, take place not during class but during lunch and the ritualized fruit-and-cookie breaks. During one of those breaks, a group of students talked technical for a while. Then, one of them came indoors, commenting to me in passing: "We've learned just what management wants to do and how it isn't doing it."

I wish I were one of them.

Horwitt is a *Computerworld* senior editor, net-working.

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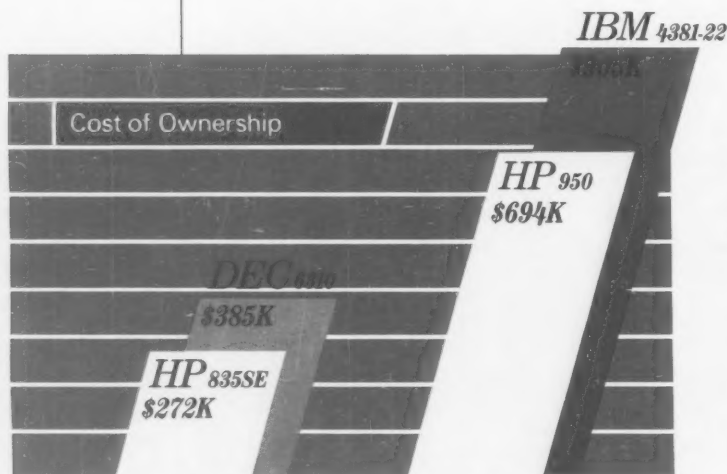
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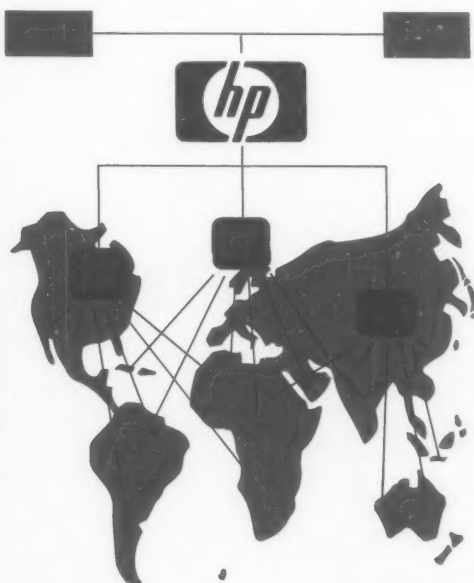
HP can cut your computing costs by 29%.

It's true. The chart at left shows you how investments in HP systems comparable to systems from IBM or DEC can reduce your cost of ownership by up to 29%*. And do so while giving you considerable benefits in terms of performance and reliability.



*Note: The cost-of-ownership figures reflect the initial purchase price and 5-year hardware and software support costs for servers configured with operating systems, memory, mass storage, and terminal connections. Prices as of Feb. 15, 1989.

better way."



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At last. A software environment that provides a common interface and allows for true integration of PC applications from different vendors. An environment that gives users a simplified, unified way of

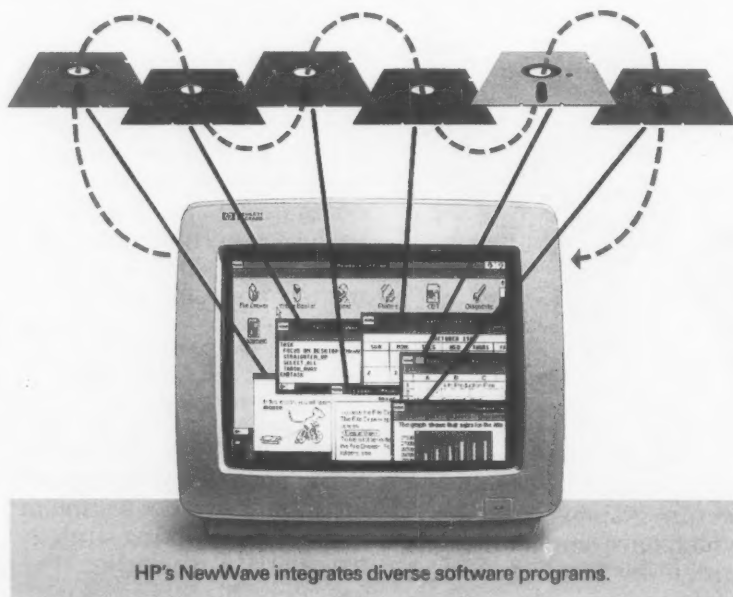
"Three weeks of retraining? Why do we have to reinvent the wheel every time we introduce new software?"

accessing, manipulating, and sharing information. Information housed in mainframes, in minicomputers, in workstations and PC's.

There is a better

It's HP's NewWave environment. With it, the usefulness of applications can be greatly expanded. Users can, for example, create documents

one is immediately reflected in the others. And it automates standard procedures across applications, greatly reducing the amount of time



that incorporate text, graphics, and spreadsheets. Send those documents anywhere in the system. And do all this using their favorite software.

But NewWave goes even further. It allows for an interaction between text, numerical, and graphical data such that a change in

spent performing repetitive tasks.

HP's NewWave environment adheres to standards* and enjoys widespread industry support. It increases user

*HP's NewWave software technology is based upon and extends the capabilities of well-accepted PC and workstation environments: Microsoft® Windows, Presentation Manager, or OSF/Motif.

way.

productivity and decreases time-to-decision. In short, it makes using your computer system far more intuitive and therefore much easier.

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In the end, it's really very simple. Only by acknowledging your frustrations and finding real-world solutions have we been able to develop networked computer systems that offer you clear competitive advantages. And only

by continuing to work with you will we be able to help you meet the considerable challenges of the future.



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John Young
President & CEO
Hewlett-Packard



**HEWLETT
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HP-Apollo union swells net haul

OSI commitment, innovation to blend in network mix

ANALYSIS

BY PATRICIA KEEFE
CW STAFF

Much of the hoopla over and dissection of Hewlett-Packard Co.'s plans to purchase Apollo Computer, Inc. have centered around workstation wars [CW, April 17]. Deviating from the obvious, there is another angle to this picture worth investigating — networking.

HP has been one of the leading pro-

motors of Open Systems Interconnect (OSI)-based connectivity. Many analysts have singled out HP as the most committed vendor by far to OSI, in deed if not in word.

"HP is the only [major systems vendor] committed to standards — good, bad or indifferent. Everyone else [i.e., IBM and Digital Equipment Corp.] is committed only to the degree necessary. HP has gone all the way," said Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C.

Proprietary Apollo, on the other hand, is known for innovation, if not market share. One highly publicized result is its Network Computing System (NCS), which is particularly relevant to workstation-based networks. Supported by more than 150 licensees, including IBM, DEC and HP, NCS is a method of allowing programmers to break up applications for distribution over multivendor machines.

At least one of these licensees could find HP arm in arm with a competitor, particularly in the factory. Back in March, Apollo and DEC joined forces to extend the remote procedure call (RPC) compo-

nent of NCS to support wide-area networks, large applications, international languages and additional network platforms and protocols. The two plan to submit the enhanced RPC specification to the Open Software Foundation (OSF) and the International Standards Organization.

Together, HP and Apollo will boast a mix of Ethernet options, proprietary Token-Ring, local- and standards-based wide-area networks, Unix support, network management and factory automation products. Add to this HP's relationship with 3Com Corp., which is focused on DOS and OS/2 work groups, and what results is a fairly complete strategy.

Still, any immediate impact for HP and Apollo network users is unlikely. Rather, this union will serve to strengthen the underpinnings of HP's future network offerings.

First, although the two allegedly share the same distributing computing vision, it will be necessary to reconcile and combine their different approaches. A convergence of those lines might occur by the time Motorola, Inc.'s 68040 is released.

Two are better than one

In the meantime, among the areas in which Edward Muns, general manager of HP's Networks Division in Cupertino, Calif., expects "two heads [to be] better than one," are the following:

• **Innovation.** Apollo will play innovator to HP's standardizing promulgation. "While they agree their strategy today needs to be more standards-based... Apollo's real strength lies in developing new capabilities and functionality."

• **Standards.** As Dzubeck noted, "You won't see HP hang its hat on anything that is not standard." Hence, Apollo's innovations will be pushed by both vendors before appropriate standards-setting bodies. "Apollo intends to offer NCS to the OSF process as functionality we believe should be used as the first release of a distributed computing offering," Muns said.

• **NCS support.** "We'll want to drive the NCS RPCs into all of our operating systems software," he said. Also, HP will first incorporate NCS into its graphics workstations, moving that support into its high-end machines over a two-year period, he said.

• **NCS ports.** Muns said users can expect MS-DOS and OS/2 ports as well as an interface to HP's LM/X, a Unix version of Microsoft Corp.'s OS/2 LAN Manager. Those extensions will be taken before standards bodies.

• **New Wave.** NCS will, of course, be compatible and coexist with HP's graphical interface. Muns also said HP and Apollo were working in the area of network graphics but declined to comment further.

• **MAP.** Apollo users have said they expect to gain from HP's heavy investment in Manufacturing Automation Protocol technology, an area in which Apollo is weak. Muns had no comment.

• **Token-Ring.** Apollo's proprietary Token-Ring flies in the face of HP's obsession with standards, but Muns said the installed base will be protected: "We'll keep it alive with minor enhancements and let the customer phase it out." Meanwhile, 3Com provides standard 4M bit/sec. Token-Ring, and both Apollo and 3Com are said to be working on standard 16M bit/sec. versions.

Muns also conceded that HP needs to provide bridges and gateways between its networks and IBM's Token-Ring.

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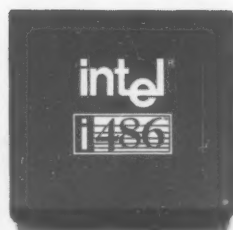
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Bain

CONTINUED FROM PAGE 51

private branch exchange in Boston, (4) request access to a particular VAX, (5) log on and (6) invoke the application.

Frequently, the connection did not get through for reasons such as the absence of free multiplexer ports, incorrect keystrokes or a downed VAX, Adler said. The user, with no clear idea of what went wrong, was forced to "back out" of the system the way he came in — another complex, time-consuming process.

Adler originally hoped to solve these problems with PC applications developed in C. He discovered, however, that developing applications in C would be too cost-

ly, especially since users kept changing screen specifications.

Adler eventually picked out two software packages that worked together to solve both of Bain's problems. Entrypoint 90, a PC-based package from Datalex, Inc. in San Francisco, enabled his people to quickly generate PC applications for entering and editing data and also provided validation. Mobius, from FEL Computing in Williamsville, N.Y., automates the process by which a PC can log on and access a VAX file or printer, translating MS-DOS records into VAX formats and vice versa. What made Mobius especially useful, Adler said, is its ability to provide application-to-application



Bain's Adler

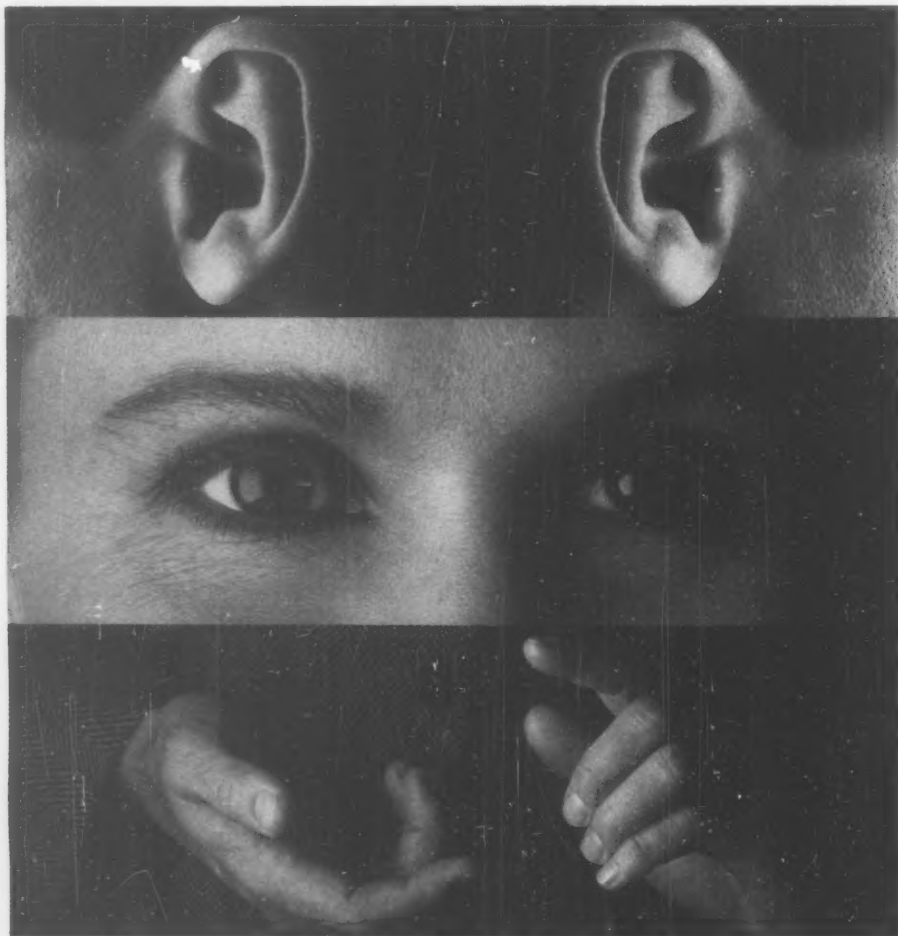
communication between a VAX and a PC so that the two systems could trade control back and forth.

Mobius also provided a way to automate Bain's complex connection procedures, taking a great load off data entry clerks' shoulders, Adler said. Popular communications packages based on Kermit or Xmodem "mixed people up; now they just need to know that 'V drive' is the VAX" to bring data down from the VAX into applications such as Lotus Development Corp.'s 1-2-3 or vice versa.

Under the current system, a clerk selects the data entry screens he wants on a menu. The data is validated as it is en-

tered. When he is finished, he pushes one button, and the PC automatically validates the file and sends it to the VAX. The VAX then makes a copy, invokes a VAX program to load the data into its own files and produces an exception report. The VAX then returns control to the PC, which breaks the connection and returns to the menu. "The user sees none of this — it's just like starting a batch job," Adler said. "Users love it."

About six people took three to four months to do the job, according to Adler. Three of those people however, were re-vamping the host-based data collection system to handle more detailed reporting, he noted. Developers also redesigned the screens a number of times, since it only took a day to do so with Entrypoint 90.



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BIT BLAST

1991 Enterprise net event now coming together

The Society of Manufacturing Engineers has committed to producing **Enterprise Networking Event 1991**, the second in a series of demonstrations of interoperability among multivendor networking products complying with industry standards. The first Enterprise event was held last year. Exact dates and location for the 1991 event are not set.

Guilbert Associates, Inc. and P. Lemme & Associates, Inc.'s "The EDI Multi-Level Training Program," a series of two-day courses in various U.S. cities, began in March and will continue through November. Call 202-785-4365 for information. Registration fee is \$550.

"Fortune 500 MIS Buying Plans," a new study from The Sierra Group, Inc., found that of the 67.2% of the 61 firms responding that have local-area networks, only 46% plan increased LAN expenditures. The interconnection of desktop devices and the continued integration of existing resources will drive systems strategies during the next 18 months, the report added, noting that "connectivity is Fortune 500's hot button."

IBM recently unwrapped two voice management products. Netview Network Call Accounting is 370 software said to process call detail records from multiple private branch exchange switches for accounting purposes. It costs \$90,000. Netview Voice Network Design is a PC-DOS- or OS/2-based package said to analyze the cost-effectiveness of transmission facilities using call detail records and tariff information that will be updated by IBM four times a year. It costs \$35,000.

Concord Communications, Inc., the Marlboro, Mass., vendor of Manufacturing Automation Protocol-based LANs, recently became a regular member of the **Corporation for Open Systems**.

Three companies have been authorized to provide licensees of Novell, Inc.'s Portable Network with porting services. These firms are Prime Computer, Inc., Lachman Associates, Inc. and Mor-tice Kern Systems.

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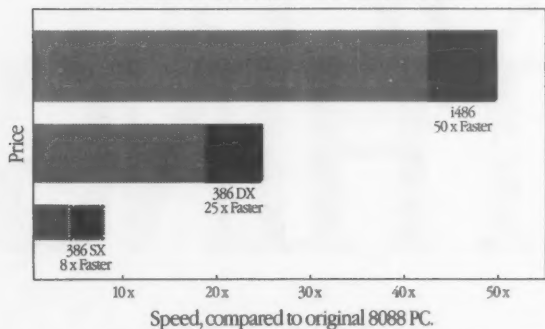
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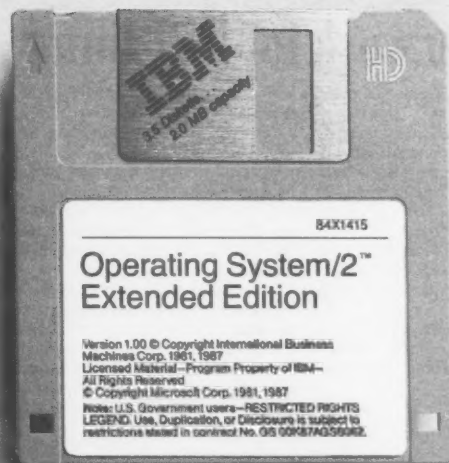
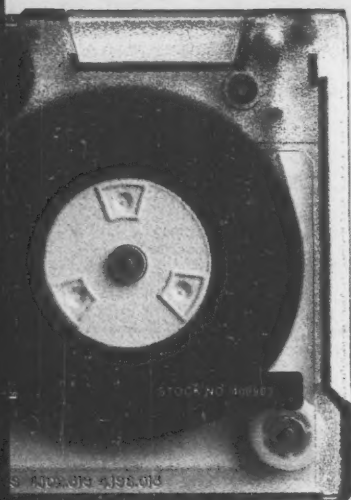
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EPA looks to trash paperwork for EDI filing

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The U.S. Environmental Protection Agency (EPA) last month said it is exploring electronic data interchange (EDI) as a way for regulated companies to submit their mandated reports electronically.

Taking a cautious and studious approach, the EPA said it has formed an Electronic Reporting Standards Workgroup to find out whether the X12 format or some other data transmission standard will be most appropriate as it moves from accepting paper reports to electronic ones.

Electronic filing of the myriad reports required by government agencies is growing increasingly popular. A recent survey showed that 68 federal agencies have electronic filing programs (see chart), and many agencies are adopting EDI to exchange forms with industry [CW, Sept. 5, 1988].

The EPA noted that electronic filing would reduce costs both for the filers that make printouts to send to the government and for the agency, which must transcribe the data and account for transcription errors. "We now receive most of this data on paper, even though submitters keep much of it electronically, and the data is often destined for computerized databases at EPA," the agency's official notice said.

The EPA invited comments from the regulated companies, state and local governments, public-interest groups and others to aid in the selection of a standard and

discuss various policy issues. The public comments are due June 16.

"We hope that such dialogue will help ensure that any data standards we ultimately develop will be as compatible as possible with current practices, both in industry and government," the agency notice said.

The EPA also asked those filing comments to focus on several policy issues that may confront the electronic filing program:

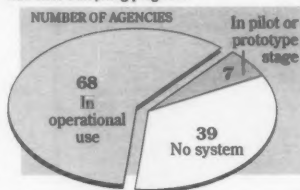
- What problems or issues will EPA have to address in using the transmitted data in administrative, civil and criminal enforcement actions?

- What should be the proper role of the information service industry?
- How will electronic reporting affect small businesses?
- What implications does the program have for public access to the data?
- What problems or issues are there in providing for the security of the data? Can the security of confidential business data be assured?

In one of its preliminary decisions, the EPA said it believes the electronic reporting program should be uniform across the agency, flexible enough to accommodate the different information requirements of each EPA program office and compatible

Electronic red tape

Of 114 federal agencies surveyed last year, 68 had electronic filing programs



SOURCE: U.S. GENERAL ACCOUNTING OFFICE
CW CHART: JOHN YORK

with the standards already in use by the regulated community and government agencies.

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If the shoe fits...

Government use of EDI gained more momentum last month when the U.S. General Services Administration (GSA) issued a regulation permitting federal agencies to use EDI to exchange billing and payment data with transportation carriers.

GSA said the EDI rule, which covers all freight and passenger carriers, is voluntary. Once a carrier and agency reach a mutual agreement, transportation companies can use their customary EDI formats, such as air, motor, ocean and rail transaction sets developed by the Transportation Data Coordinating Committee.

However, the operational details of EDI transactions must be approved by the GSA's Office of Transportation Audits to ensure that individual EDI programs meet the documentation and accounting needs of the government. The EDI transaction, the GSA added, must have an authentication signature — a discreet personal identification number or code — to bind parties to the terms and conditions of the contract.

MITCH BETTS

NEW PRODUCTS

Network management

Bytex Corp. has announced a low-end matrix switch that is said to provide the any-to-any switching and network management features of its higher end products at a price that is competitive with patch panels.

Autoswitch XP is targeted at smaller sites that want to be able to switch lines to more than one backup system and monitor multiple ports from a central computer without having to move lines physically from one port to another, Bytex spokesman Barry Charton said.

The product is priced between \$15,000 and \$20,000 — the price of a typical patch panel that provides simple A-to-B switching between a primary and backup system, Charton said. Autoswitch XP is designed to provide remote testing for unmanned sites, allowing the user to connect test equipment at a central site to specific ports at a remote site.

The Autoswitch XP is priced at approximately \$200 per port. It can be equipped with a real-time monitor and two RS-232 port sets, providing 32 ports, Bytex said. It reportedly supports a variety of protocols, including V.35, X.25, T1 and analog interfaces. It can be managed

by Bytex's Unity network management system.

Bytex
Southboro Office Park
120 Turnpike Road
Southboro, Mass. 01772
508-480-0840

Interlan, Inc. has introduced another version of its Lan Detector Ethernet protocol analyzer.

Version 2 uses a proprietary Ethernet interface card and operates in an IBM Personal Computer AT or compatible platform, the company said. The product reportedly provides field-upgradable protocol capabilities and offers support for extended memory-expanding frame capture buffers. Menus and Help screens are

also included. The product is shipped with complete documentation and a diagnostic disk. It is priced from \$10,000 to \$15,500, depending on protocol selection.

Interlan
155 Swanson Road
Boxboro, Mass. 01719
508-263-9929

Com Dev, Inc. has upgraded its line of remote alarm management processing devices, the company said.

The Dispatcher E Series reportedly was designed for use with public branch exchange systems, data communications and other automated systems to monitor ASCII data streams for key words that indicate a fault or other alarm condition. The units are available in both 300 and 1,200 bit/sec. models and are priced at \$900 and \$1,225, respectively. Quantity discounts are available.

Com Dev
2150 Whitfield Industrial Way
Sarasota, Fla. 34243
813-753-6411

Electronic mail

Gammalink has introduced a software product that enables 3Com Corp.'s 3+ Mail users to transmit electronic mail messages to facsimile machines internationally, according to the company.

Called Gammamail, the product is reported to be a virtually transparent extension of 3+ Mail that automatically converts messages for facsimile transmission and routes them to their destination.

The Gammamail facsimile server requires Gammamail Fax-Mail software and the Gammafax CP add-in board, which are priced at \$995 and \$1,095, respectively.

The products run on IBM Personal Computer XTs, ATs or compatible systems.

Gammalink
2452 Embarcadero Way
Palo Alto, Calif. 94303
415-494-7042

Cappcomm Software, Inc. has announced a version of its electronic mail workstation software designed to automatically interface with Digital Equipment Corp.'s VMS Mail software.

Mail Call-VMS adds Help screens, separate mail folders, off-line mail creation and management capabilities, the vendor said. The software will be sold by site distribution license, with pricing ranging from \$1,000 for a VAX-11/730 to \$19,000 for a VAX 8900, regardless of the number of personal computers exchanging mail with the host VAX.

Cappcomm Software
Suite 1003
26 Journal Sq.
Jersey City, N.J. 07306
201-795-1500

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 **LEVEL5**
Information Builders, Inc.

Protocol converters

A multiport protocol converter that provides ASCII devices with dial-up or direct access to IBM Systems Network Architecture via an IBM 3074 series controller has been announced by Renex Corp.

Scheduled to ship in June, the Protocol Converting Multiplexer attaches up to eight ASCII devices via one coaxial connection and provides full 3270 emulation capabilities, according to the company. The unit is priced from \$5,495.

Renex
1513 Davis Ford Road
Woodbridge, Va. 22192
703-494-2200



Renex's multiport protocol converter provides access to SNA

JDS Microprocessing has announced that its Hydra II protocol converter and controller unit is now available with a call-back security function.

The security facility was designed to prevent unauthorized access of the mainframe by remote callers. Remote users dialing into the Hydra II must enter the appropriate password, and the product requires that all dial-up users operate from a predetermined location, the company said.

Hydra II is reported to be a direct channel-attached protocol converter that provides IBM 3277 and 3278 emulation for IBM Personal Computers and ASCII peripherals. According to the vendor, pricing ranges from \$4,900 to \$16,900, depending on configuration.

JDS Microprocessing
Suite 206
22661 Lambert St.
El Toro, Calif. 92630
714-770-2263

Modems/Multiplexers

Licom has announced enhancements to its line of T3 network multiplexer products.

According to the company, a reverse protection ring option is now available for the IMX30 unit. The option restores T3 traffic after a fiber-optic cable cut or other facility failure. The upgrade is priced at \$6,000 per node.

The Limacs/Remote workstation is said to be an extension of the Limacs surveillance and control system and was developed to allow smooth integration of IMX30 nodes into existing network management systems. The product is available for a \$7,000 onetime fee for up to 100 nodes.

Licom
593 Herndon Pkwy.
Herndon, Va. 22070
703-689-0500

Two 2,400 bit/sec. modems have been introduced by Okidata, an Oki America, Inc. company.

The Okitel 2400 Plus external modem and the Okitel 2400B Plus internal modem operate in full- or simulated half-duplex mode over public or dedicated lines, the vendor said. The units reportedly feature Microcom Networking Protocol Class 5 with 2-to-1 data compression.

The 2400B Plus full-card internal device is intended for use with IBM Personal Computers and compatibles as well as IBM Personal System/2 Models 25 and 30. It is priced at \$499. The 2400 Plus external modem costs \$549. Both products are reportedly offered with extended five-year warranties.

Okidata
532 Fellowship Road
Mt. Laurel, N.J. 08054
609-235-2600

OS/2 networking

Incomm Data Systems, Inc. has announced a series of internal, error-correcting 2,400 bit/sec. modems for the IBM Personal System/2 Models 50, 60, 70 and 80.

The TB PS 48 IBM Micro Channel Architecture-based modems are reported to be fully Personal Computer AT compatible and are shipped with all necessary software and full documentation. Each is priced at \$499 and is backed by a five-year warranty, the vendor said.

Incomm
652 S. Wheeling Road
Wheeling, Ill. 60090
312-459-8881

Sunriver Corp. announced that its Fiber Optic Stations are now supported under IBM's Micro Channel Architecture (MCA). The MC-40 Server Lightcard is a four-port fiber-optic communications adapter. When installed in an MCA bus of an Intel Corp. 80386-based microcomputer, the product gives each Fiber Optic Station user the same power, performance and graphics capabilities as those found on the console of a 386 machine, the vendor said.

The MC-40 Server Lightcard is priced at \$899. The Fiber Optic Stations are priced from \$899.

Sunriver
108 Business Park Drive
Jackson, Miss. 39213
601-957-0100

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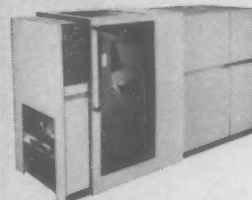
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Mary V. Goracy

Mary V. Goracy
Vice President
Corporate Distribution and Support Services
Charles Schwab & Co., Inc.

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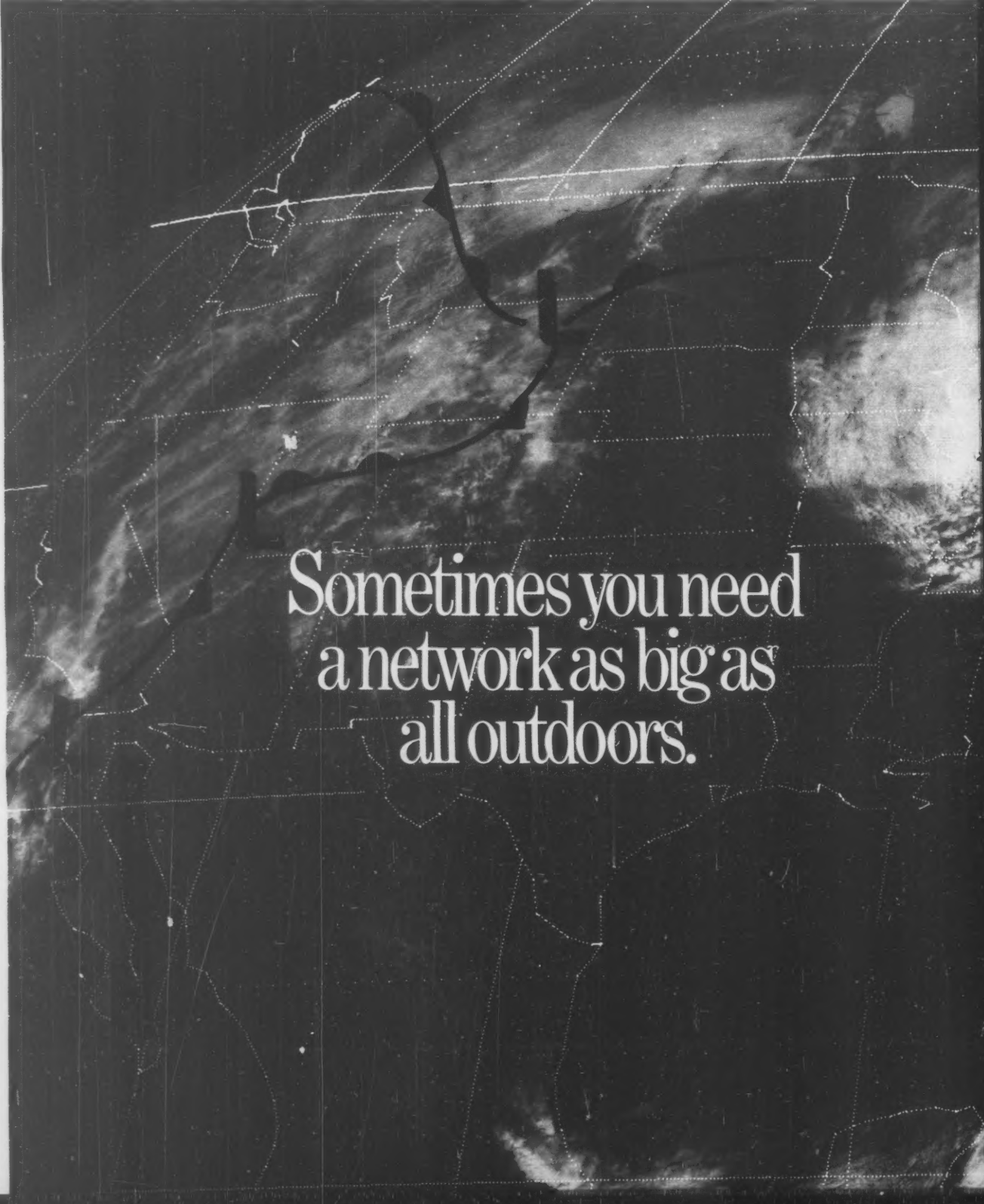
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Peripheral Systems Division
240 East Palms Road
Anaheim, CA 92805
(714) 991-9700

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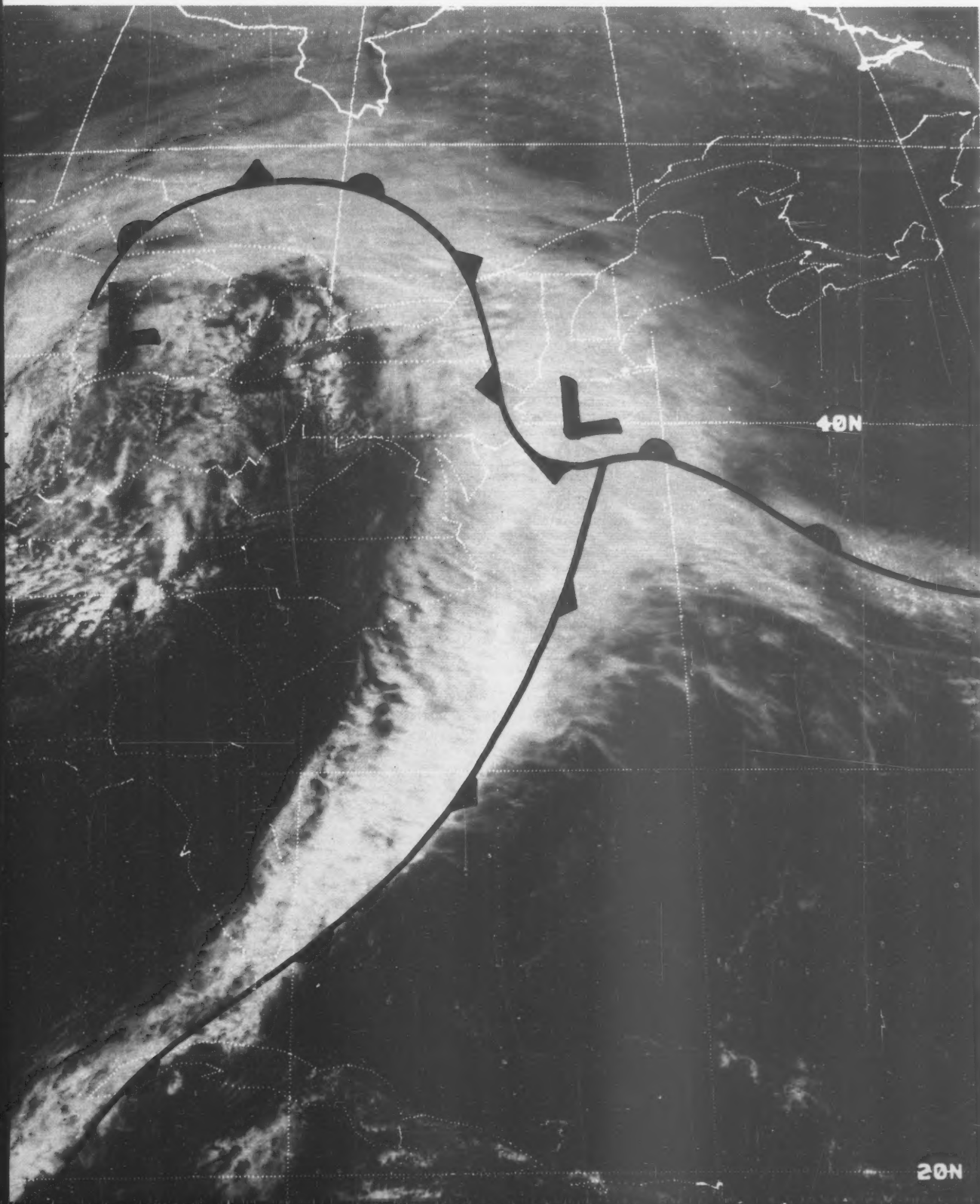
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Diagnostic equipment

A family of portable, single-function test units designed specifically for low-cost applications has been introduced by Tektronix/LP Com.

The TC1000 is reportedly based on an IBM-compatible personal computer and consists of a 20M-byte hard drive, 640K bytes random-access memory and a 600- by 400-pixel plasma display. The 24-pound unit can perform the following testing functions: T1/plug-compatible mainframe/BERT, Protocol Transmission Impairment Measurement Sets, local-area network and Integrated Services Digital Network/BRI.

Pricing ranges from \$7,500 to \$11,600, depending on testing environment. The unit is slated for shipment in June.

Tektronix/LP Com
205 Ravendale Drive
Mountain View, Calif.
94043
415-967-5400

Electrodata, Inc. has expanded its product line with a handheld, T-carrier monitor.

The battery-operated TM 1 was designed to monitor in-service T1 equipment and circuits, or out-of-service T1 transmitters, the company said. The product is reportedly used at installation to verify correct transmitter operation and for maintenance to isolate problems to the span or end-user equipment. It is priced at \$795.

Electrodata
23020 Miles Road
Bedford Heights, Ohio
44128
216-663-3333

A handheld protocol analyzer and testing device has been introduced by Digitech Industries, Inc.

Designated the Model DS300, the product reportedly weighs less than three pounds and is powered by a rechargeable battery or AC adapter. Standard features include an 8-line by 32-character LCD screen and 96K bytes of memory, and the unit supports all common protocols and code sets at speeds up to 64K bit/sec.

The device is priced at \$1,995.

Digitech Industries
P.O. Box 547
Ridgefield, Conn. 06877
203-438-3731



Digitech's portable protocol analyzer and testing unit

International Data Sciences, Inc. has announced a testing product designed for T1, AT&T's Data-phone Digital Service, Integrated Services Digital Network and all synchronous and asynchronous networks.

The Model 76A is capable of testing networks running at data rates ranging from 10K bit/sec. to 10M bit/sec. and features a variety of plug-in modules, including RS-232-C and V.35.

Available in handheld, portable and rack-mount versions, the product is priced from \$1,295. Interface modules are priced

from \$295.

International Data Sciences
7 Wellington Road
Lincoln, R.I. 02865
800-IDS-DATA

Tandem Computers, Inc. has announced several standards-based networking products designed to enhance access between all major network environments and Tandem on-line transaction processing systems. According to the company, SNAX/CDF, Tandem OSI/AS and Tandem Transmission Control Protocol/Internet Protocol (TCP/IP) allow users to access Tandem applications from non-Tandem networks, including IBM Systems Network Architecture, Open Systems Interconnect and TCP/IP. The initial license fee for SNAX/CDF starts at \$3,500, \$2,475 for Tandem OSI/AS and \$4,000 for Tandem TCP/IP.

Also announced was Expand/LAN, an enhancement to Tandem's Expand distributed networking software. It is available at no extra charge with the Expand software license, the vendor said.

Tandem Computers, Inc.
19191 Vallico Pkwy.
Location 4-40
Cupertino, Calif. 95014
408-725-6000

Unisys Corp. has announced a network communication processing system designed specifically for small user sites.

According to the company, the Distributed Communications Processor Model 5 is contained within a Unisys Personal Workstation Model 500 computer and can support processing rates as high as 14 transaction/sec. With maximum configuration allowances, the product is said to accommodate up to seven communications lines or five separate protocols.

Pricing ranges from \$9,800 to \$14,300, depending on configuration.

Unisys
P.O. Box 500
Blue Bell, Pa. 19424
215-542-5367

Mitek Systems Corp. has released expanded peer-to-peer communications capability for the firm's Openconnect line.

The enhancement reportedly allows users on IBM and non-IBM systems to conduct peer-to-peer communications. The Openconnect/Advanced Program-to-Program Communications feature provides the ability for a Transmission Control Protocol/Internet Protocol (TCP/IP) user application to make LU6.2 calls to a peer IBM communication across TCP/IP and Systems Network Architecture networks. It costs \$170.

Mitek
2033 Chennault Drive
Carrollton, Texas 75006
214-490-4090

McDonnell Douglas Network Systems Co. has announced a communications processor for its Tymnet packet-switched networks.

The Compact XL offers support for the full range of Tymnet protocols, including asynchronous, X.25, Systems Network Architecture and others, and will be available for installation in August, the company said.

Designed as an intermediate-size node on the network, the product reportedly supports applications that require a moderate number of interconnections. It is hardware- and software-compatible with all existing Tymnet processors and can run concurrently in the same network with other Tymnet switches as well as respond to network management and control functions. Other features include network gateways and virtual circuit network paths.

Pricing ranges from \$233 per port to \$1,650 per port, depending on the number of ports that are protocol-supported.

McDonnell Douglas Network Systems Co.
P.O. Box 49019
San Jose, Calif. 95161
408-922-7583



McDonnell Douglas' processor supports Tymnet

A dial-up security product for single-line, dial-up systems has been introduced by Lee Mah Datamart Security Corp.

The Traqnet 2001 reportedly supports up to 256 users and protects single-line systems using either call-back or secure call-in technology. Security applications for the product include mainframe or minicomputer maintenance ports, LAN-to-LAN, PC-to-PC, or host-to-host dial-up communications lines, the vendor said.

Features include remote directory configuration and remote audit trail download capabilities.

The system costs \$995 with

the proprietary Infokey portable secure call-in device and \$845 without it, the vendor said.
Lee Mah Datamart
3948 Trust Way
Hayward, Calif. 94545
415-786-0790

Novell, Inc. has announced Version 1.1 of its Netware SNA Gateway Products.

The company has reportedly added several features to the workstation component, including lower memory usage, enhanced screen size support and enhanced vector graphics capabilities. The latest release also provides a network management status utility, the vendor said, which allows local-area network administrators to monitor networks from an on-line screen.

The latest release will be available in the second quarter. Current Netware SNA Gateway 1.0 customers may upgrade to Version 1.1 at no extra cost.

Novell
122 E. 1700 S.
Provo, Utah 84601
800-453-1267

A 9.6K bit/sec. facsimile board that incorporates a 2,400 bit/sec. Hayes-compatible modem has been unveiled by Quadram Corp.

The JT Fax Pro96 is scheduled to ship May 30 and will be packaged with software designed to control both facsimile and data communications functions. The full-length card runs in IBM Personal Computers and compatible systems and costs \$495.

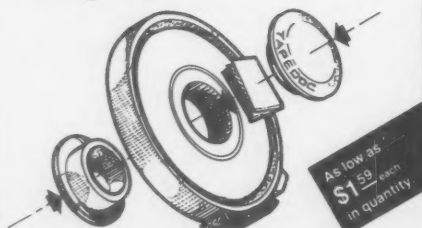
Quadram
One Quad Way
Norcross, Ga. 30093
404-923-6666

The Logical Co. has announced two fiber-optic controllers for use in Digital Equipment Corp.'s line of VAX and PDP-11 computer systems.

The BCU-1000 is a Unibus-compatible controller for use in the VAX and PDP-11 series, and the BCQ-1000 is a Q-bus compatible controller designed for Microvax and Micro/PDP machines, the vendor said. The products can be used to repeat, extend or convert the host computer's bus and are priced at \$1,295 each.

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Cottage Grove, Ore. 97424
503-942-3610

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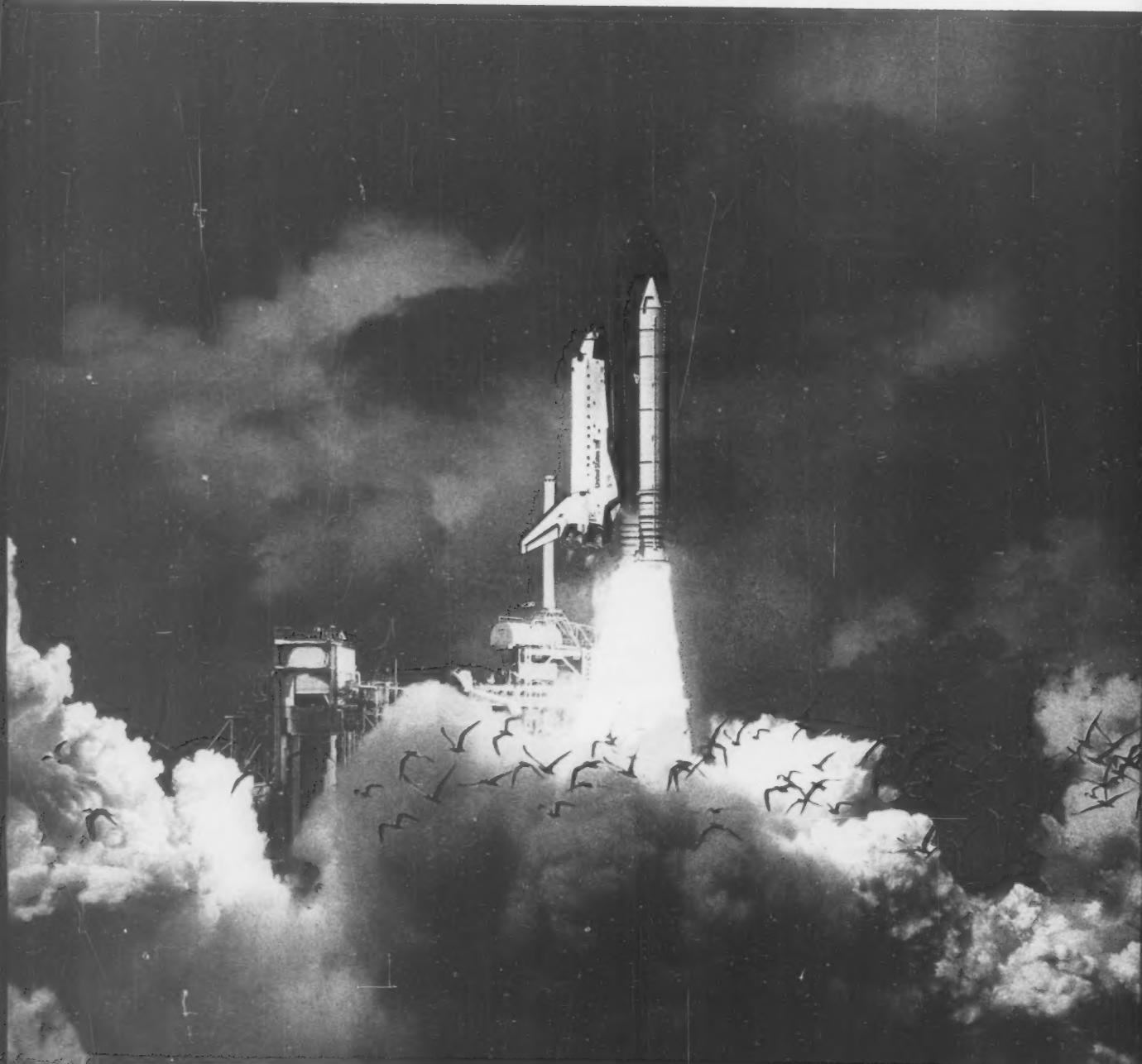
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Local-area networking hardware

Plus Development Corp. has introduced an error-free interface for personal computer local-area network file servers.

The Defect Free Interface reportedly eliminates the need to run the full Novell, Inc. Netware Compsurf program when installing a hard drive on a Novell network. The product automatically removes and replaces defective disk sectors to simplify the installation process, according to the vendor. It will be shipped as a standard component of the company's Plus Impulse hard-disk system.

The hard disk is available in both 40M- and 80M-byte configurations and carries

a price tag of \$895 and \$1,195, respectively.

Plus Development
1778 MacCarthy Blvd.
Milpitas, Calif. 95035
408-434-6900

Samsung Information Systems America has introduced an Ethernet interface card for personal computer local-area network environments.

Designated the SE2100, the card reportedly has a 16-bit-wide shared memory interface with the host PC and offers 16K bytes of random-access memory for packet buffering, the vendor said.

The board carries a price tag of \$499, the company said.

According to the company, the product

will be shipped with software drivers to support all versions of Novell, Inc.'s Netware 2.0A and above.

Samsung
77 Tasman Drive
San Jose, Calif. 95134
408-434-5400

Unisys Corp. has introduced an entry-level version of its Usernet local-area network.

The Entry Level System II is reported to be hardware compatible with Ethernet network architecture as well as with Novell, Inc.'s Netware LAN products. The system links individual MS-DOS-compatible personal computers to the Usernet LAN at an approximate cost of \$4,000 per workstation, the vendor said.

Pricing is based on a five-user configuration.

Unisys
P.O. Box 500
Blue Bell, Pa. 19424
215-542-2240

Local-area networking software

Work group software developed specifically for managers has been announced by Information Research Corp.

Called Syzygy, the product reportedly assists in managing activities, resources, schedules and budgets. Features include hierarchical activity lists and multilevel Gantt charts, the vendor said.

The program runs on IBM Personal Computers and Personal System/2s with a minimum of 512K bytes of random-access memory and a hard disk, according to the vendor.

The network version of Syzygy is priced from \$795 to \$2,995, depending on number of users.

Information Research
2421 Ivy Road
Charlottesville, Va. 22901
800-368-3542

Ncompass Software, Inc. has announced Workgroup 1.5, an upgrade of the package formerly marketed under the name Landscape, the company said.

The groupware product reportedly enables network users to share files and retrieve a document or file anywhere on the network using a variety of search criteria. Enhancements include round-robin updating of profile databases installed on multiple servers. The upgrade costs \$995 and is licensed on an unlimited-user-per-file-server basis.

Ncompass
Suite 702
270 Lafayette St.
New York, N.Y. 10012
212-925-0020

Waterloo Microsystems, Inc. has increased the number of supported workstations on the company's Port Lite local-area network from five to a maximum of 10.

The Port Lite Expander was developed for entry-level LAN environments composed of IBM Personal Computers, Personal System/2s and compatible hardware platforms, the vendor said. Users may choose either an icon or DOS interface. The Expander is priced at \$395.

Waterloo Microsystems
Suite 200
3597 Parkway Lane
Norcross, Ga. 30092
404-441-9252

A backup and restore product for Unix-based networks has been announced by Unitech Software, Inc.

Called Backup.Unet, the software system permits centralized and decentralized backups and restores and allows sharing of tapes and drives from one or more terminals. A summary log report is maintained to indicate which systems successfully completed backups and which did not, the company said. Pricing ranges from \$2,500 to \$35,000, depending on configuration and number of users.

Unitech Software
Suite 101
1800 Alexander Bell Drive
Reston, Va. 22091
703-264-3301

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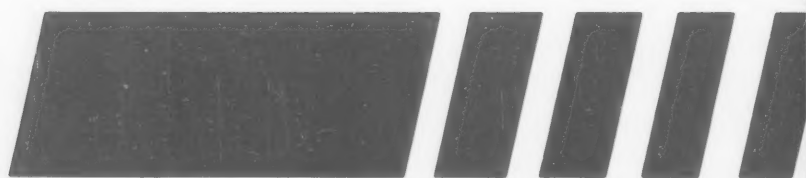
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MANAGER'S JOURNAL

EXECUTIVE TRACK



Peter F. Palmisano has been appointed vice-president for computer and information resources at **Camp Dresser & McKee, Inc. (CDM)** in Cambridge, Mass. He is responsible for the environmental consulting firm's corporate data center, corporate MIS, the nationwide backbone network and ongoing consultation and support for project-related computer needs.

Palmisano joined CDM in 1975 and has held progressively more responsible positions in computer services and information management.

He holds a master's degree in business administration from Northeastern University's High Tech MBA program. He is a member of the Society for Information Management and the Project Management Institute and resides in Weymouth, Mass.

Tom Hagan has been named vice-president of the data processing support division of **Technical Communications Associates**, an information systems consulting firm in Sunnyvale, Calif. He will direct all consulting, training and technical support activities for state and local government clients.

Hagan was state director of IS for the State of Louisiana from 1978 to 1984 before departing to develop his own consulting business.

William A. Buckner has been promoted to vice-president of IS at **Britches of Georgetown**, a retail clothing chain in Herndon, Va.

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor-Management, *Computerworld*, Box 9171, 375 Conituate Road, Framingham, Mass. 01701-9171.

Merging without purging

With the changing resources, IS execs must have a well-defined plan

BY JEAN S. BOZMAN
CW STAFF

Mergers and acquisitions of corporations call for a skillful blending of information systems functions, say two experts in the field who regularly advise major corporations on the subject.

IS executives have to contend with radical changes in IS resources, limited data processing budgets and a rumor mill that just won't quit, said O. Bruce

Gupton, president of International Systems Services Corp. (ISS) in Stamford, Conn. "There often is a conquering-army syndrome, with the guys on top saying 'We'll do it our way,'" Gupton told a recent Technology Transfer Institute seminar in San Francisco.

But many of the ideas of the IS group being taken into a new organization should not, in fact, be overlooked, Gupton cautioned. "The thing to do is to have a well-thought-out plan and to move quickly," said Gupton, who learned his specialty as a former Price

Waterhouse partner advising merged business units before 1981.

Some of the very best-laid plans for mergers bring IS managers into the decision-making process from the start, he said. But sometimes IS finds out later on, thus complicating the whole process. A proper merger or acquisition plan should include a period of "due diligence"—a time when the acquiring organization evaluates the new business unit to determine its hardware and software requirements.

"Both sides need to have a clear picture of exactly what is included in the deal," Gupton explained. "If it's not spelled out, you might end up negotiating it after the fact." Among the IS functions affected by a merger, acquisition or spin-off are capacity planning, staffing, software licensing and support of end users. "In the midst of all this massive change for IS, you still have to service your existing users," Gupton said.

When merging two IS organizations, users evaluate the following criteria: capacity, cost, usability, reliability, compatibility, flexibility and security. They should also try to gauge the amount of risk involved in the integration of the two IS groups and provide for auditing the information systems, Gupton said.

Planning for mergers and acquisitions has changed greatly since 1981, said Hoy Heise, vice-president of management services at ISS, who addressed the same seminar. "The 1980s have been a time of decentralization from an MIS perspective," Heise said. "There are several paths a company could take to achieve that goal, including the dispersment of

Continued on page 82



STEVE LYONS

UTC info chief: No risk, no reward

BY CLINTON WILDER
CW STAFF

Successful IS executives of the 1990s must practice and encourage something they have often shied away from: taking risks.

That was the gospel preached recently by John Hammitt, vice-president of information systems at United Technologies Corp. (UTC) at the Society for Information Management (SIM) Boston chapter's monthly meeting. Hammitt joined Hartford, Conn.-based UTC last fall after leaving the top IS post at Pillsbury Co.

"For the last 20 years, our goal has been simple: Keep out of trouble," Hammitt said. "We have encouraged people to be afraid to do anything strange. We have to start rewarding people for falling on their face so that

they'll try again."

The competitive advantage gains from information technology will occur only in such a risk-taking corporate culture, Hammitt said. Noting that the early strategic IS breakthroughs at American Airlines and American Hospital Supply Corp. occurred "by accident," Hammitt called on the IS community to encourage user innovation.

"There is no prescription for competitive advantage [through IS]; the people who have succeeded at it haven't established a pattern," said Hammitt, who currently serves as president of SIM.

Hammitt suggested that the precision of a computer technologist's binary world has been a barrier to the more nebulous world of the corporate boardroom. "We need more tolerance for ambiguity," he said. "Top executive decisions are made in the absence of

sufficient facts, a world in which two of the more common words are 'maybe' and 'perhaps.' We have to move into that world."

Hammitt urged IS executives to focus on links with the business functions of product development, purchasing, marketing/sales, distribution and customer service rather than the traditional back-office functions.



United Technologies'
Hammitt plays Risk now

TAKING
CHARGE

Jean S. Bozman

Time to
communicate

Understanding, explaining and implementing technology — all three tasks fall under the job description of IS executive. But staying on top of technology is not enough

anymore, we're being told. Experts are saying that dealing with people remains the greatest challenge of the information systems manager.

People have been known to resist technology, and sometimes that resistance climbs geometrically with age. Those under age 35 may have no trouble using an intelligent workstation, but their 45-year-old managers can't find all the keys on the keyboard — and the 60-year-old senior executive is positively adamant about staying away from personal computers.

Even those conversant in computer technology are sometimes confronted with future shock. Advocates of Lotus' 1-2-3 may not want to move to a Unix machine and new applications. A conversion from one mainframe accounting system to another is also fraught with changes for its end users. What's an IS executive to do?

Let's talk

The simple answer can be said in just one word: communicate. "The need for education is more massive and more deep than you realize," warned Michael Scott Morton, a professor at MIT's Sloan School of Management. "You need to create a level of trust, a safety for the work force."

You can mandate change, but you can't mandate compliance, Morton told IS managers gathered at a recent Society for Information Management (SIM) conference in Napa, Calif. "Technology must be kept in context of the rest of the organization. A lot of people are just plain dragging their feet and doing nothing," he said. "The resistance is coming from middle management, from people not young enough to be comfortable with the technology."

Yet change, propelled by global competition, will come. As it does, communication and education can help bridge the gap between IS' plans and real-world foot-dragging. The need to communicate effectively with senior corporate management at every step is crucial for continued funding of technology-based projects.

There are ways to ease the task of communicating with senior management. Some experts, such as Victor Janulaitis, a former IBM executive who is now president of Positive Support Review in Los Angeles, recommend pithy and colorful summaries of IS projects' status.

"The typical CEO doesn't sit down at a computer terminal," Janulaitis told the SIM gathering. "It's better to give him something he can take along on a plane." Among the things IS should show that

CEO, he said, are numbers that justify the IS budget and statistics demonstrating that while costs are up, the cost per transaction is actually going down.

As we plunge onward to the 1990s, the stress on IS will become even greater as it becomes the "technological architect of the corporate information infrastructure," said Gartner Group Vice-President William J. Caffery at the SIM event. "You will be coordinating the business strategic planning and bringing it into alignment with the corporate information strategy."

To gain a new perspective on things, MIT's Morton recommends that IS executives take a breather from their daily routine. In fact, they ought to take a few days off every now and again to take a

look at the big picture. "The time has come to step back," Morton said. "You need to leave the office once a month with two colleagues — and without lots of papers and details and numbers. You need to think and to make some choices. And that means freeing up some time in a schedule that is already too busy."

If that doesn't happen, Morton suggested, the problems of the 1990s will crowd up on IS, which will be condemned to reacting rather than planning. It may be that new technology cannot be predicted. Once it is here, Morton says: "Change will come only as fast as we, as humans, can absorb it."

Bozman is *Computersworld's* West Coast bureau chief.

IS merger

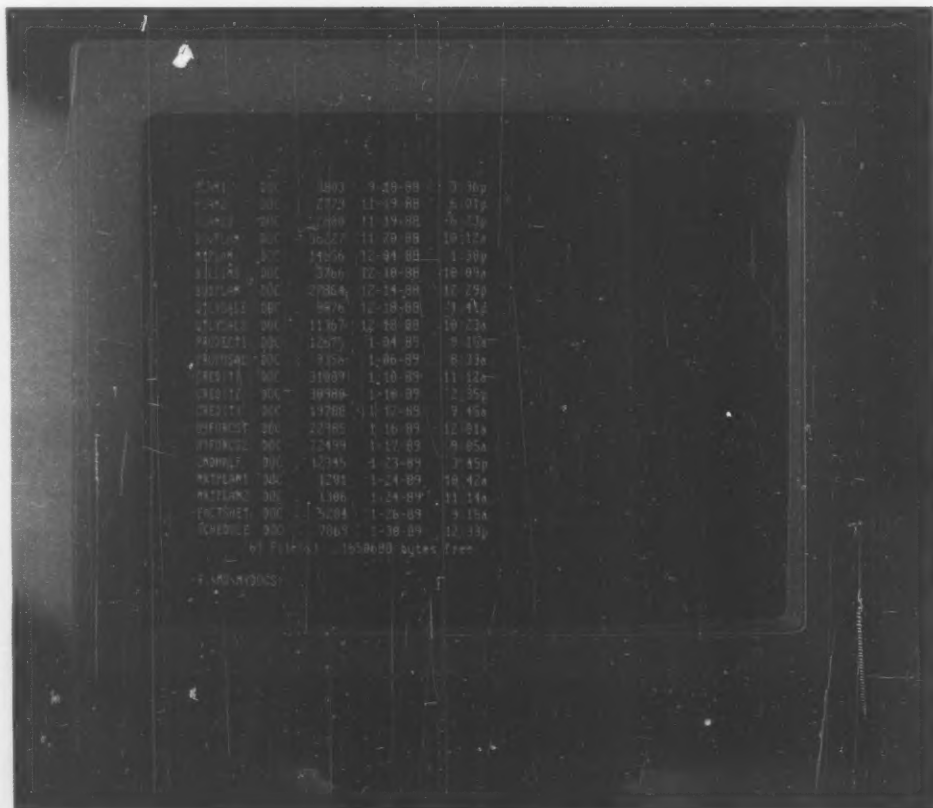
CONTINUED FROM PAGE 81

systems development capability to the local business units and the downsizing of all IS operations. You see both things happening."

Like a divorce, a spin-off is largely a process of deciding what property belongs to whom, Heise said.

Often, a decision has to be made about when a spun-off business unit should be made freestanding in terms of IS, according to Heise.

"You're usually deciding whether they should be on a freestanding basis permanently," Heise said, "or whether they should be that way temporarily, before

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they can be assimilated into another organization."

Many times, IS organizations will adopt a "hybrid" approach, Heise said. That means that the overall corporation might centralize data operations or consolidate data centers while regionalizing other functions.

"There are economies of scale to be achieved in centralized operations," Heise said, "but a corporation will often let successful business units stand alone [in terms of IS]."

Ah, the pain

Transition is most painful when there is no detailed plan drawn up of the means to accomplish it. "Strategies are often made on the fly, after the business deal goes

down," Heise said.

The changeover itself may take as long as six months to a year. "It's not unusual to see a transition agreement, which is a services agreement for the business units," Heise added. "The whole art of pulling this off is understanding the operative business conditions."

Mergers can be scary, Gupton admitted, but IS executives and managers should remember that they are not being asked to do something that is entirely new.

"Even though there is some uncharted territory in terms of the merger or acquisition, your IS group is using the same basic techniques they always do," Gupton said. "You're just doing more tasks in a very compressed period of time."

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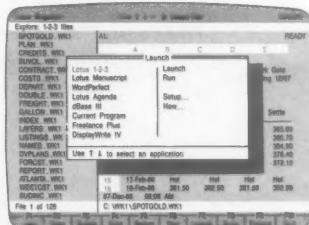
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CALENDAR

Senior executives from four Fortune 500 corporations will present their views on key IS issues of the 1990s at a symposium May 21-23 in Los Angeles sponsored by the University of California at Los Angeles. "The Decade Ahead—Gateway to the 21st Century," part of the Information Technology and the Modern Organization series, will feature chief executive officers from Bergen Brunswig Corp. and Great Western Financial Corp. and vice-presidents from IBM and TRW, Inc. For more information contact Ginny Hyatt, Information Systems Research Program, Anderson Graduate School of Management, UCLA, Los Angeles, Calif. 90024.

MAY 7-13

Association for Systems Management's Information Systems Conference. Dallas, May 7-10 — Contact: Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

Annual Meeting and Conference of the Software

Maintenance Association. Atlanta, May 7-10 — Contact: Marimac Corp., 6790 E. Calle Dorado, Tucson, Ariz. 85715.

VIP '89: Duquesne Systems' International User Group Conference. Dallas, May 7-12 — Contact: Tracy Karapandi, Duquesne Systems, 2 Allegheny Center, Pittsburgh, Pa. 15212.

Eastern Communications Forum. Washington, D.C., May 8-10 — Contact: Professional Educational International, Suite 740, 303 E. Wacker Drive, Chicago, Ill. 60601.

Executive Information Systems seminar. San Francisco, May 8-10 — Contact: Technology Transfer Institute, 741 Tenth Street, Santa Monica, Calif. 90402.

CASExpo Spring '89. Washington, D.C., May 8-12 — Contact: CASExpo, Suite 1210, 2 Skyline Place, 5203 Leesburg Pike, Falls Church, Va. 22041.

Long Range Information Systems Planning. Orlando, Fla., May 8-10 — Contact: American Management Association, 135 W. 50th St., New York, N.Y. 10020.

DECUS. Atlanta, May 8-12 — Contact: Digital Equipment Computer Users Society, 219 Boston Post Road (BP02), Marlboro, Mass. 01752.

Independent AS/400 Conference. Toronto, May 9 — Contact: Diane Flacks, International Data Corp., Suite 1000, 7 King St., Toronto, Ontario, M5C 1A2.

Successful Information Strategy Seminar. New York, May 9-10 — Contact: Suzanne Morrison, Holland Systems Corp., 3131 South State St., Ann Arbor, Mich. 48108.

National Financial Computer and Automation Conference. New York, May 9-11 — Contact: National Fincom, P.O. Box 1151, Englewood Cliffs, N.J. 07632.

Fourth International Optical Storage Forum. San Jose, Calif., May 9-11 — Contact: Cartridge & Associates, Suite 202, 3097 Moorpark Ave., San Jose, Calif. 95128.

Corporate-to-Corporate EFT and Financial EDI Annual Conference. Chicago, May 10-12 — Contact: Corporate EFT/EDI Conference, P.O. Box 710, Oak Park, Ill. 60303.

Information Systems in Transition Conference. Wellesley, Mass., May 11 — Contact: Center for Information Management Studies, Jerry Kanter, Executive Director, Horn Room 217, Babson College, Wellesley, Mass. 02157.

Managing Technology As a Strategic Resource. Pasadena, Calif., May 11-12 — Contact: California Institute of Technology, Industrial Relations Center, 1-90, Pasadena, Calif. 91125.

MAY 14-20

Adapco's 70th Management Conference. San Diego, May 14-17 — Contact: Adapco, Office of Public Communications, Suite 300, 1300 N. 17th St., Arlington, Va. 22209.

Information Infrastructure: New Options for Information Providers. San Diego, May 14-17 — Contact: IIA Meeting Department, Suite 800, 555 New Jersey Ave., N.W., Washington, D.C. 20001.

International Conference on Robotics and Automation. Scottsdale, Ariz., May 14-19 — Contact: IEEE Robotics and Automation Council, P.O. Box 3216, Silver Spring, Md. 20901.

SHARE 72.5 Interim Seminar. Denver, May 14-17 — Contact: SHARE Headquarters, Suite 600, 111 E. Wacker Drive, Chicago, Ill. 60601.

Symposium on Information Management. Kansas City, Mo., May 14-18 — Contact: Business Forms Management Association, Suite 712, 519 S.W. Third Ave., Portland, Ore. 97204.

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Simmons steers steady course

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — If Bankamerica Corp. were a racing yacht competing against nearly 100 other banks on a sea of financial markets, it would be able to change course easily as the winds of business shifts.

As executive vice-president of Bankamerica's Systems Engineering division, Michael Simmons has made maneuverability a priority in his first 10 months on the job. He is building flexible information systems that can be changed as the bank's course changes.

"When the mission was to get from the Old World to the New World, everybody went in a boat," said Simmons, drawing a broad analogy to today's global competition. "Did they all sail the same speed, and did they all take the same course? No, but they all got to the New World."

The challenge for Simmons was to jump on board a boat that was already under sail. He came to Bankamerica last summer from the top IS post at Fidelity Investments, Inc., only to find there were 2,000 projects on the MIS plate. Among all of these, Simmons has focused on two major projects: integrating dozens of IS networks into a single, backbone network

and building a new branch-automation system called COIN, for Customer On-line Information Network.

COIN involves the wholesale replacement of the bank's 15-year old Bunker Ramo terminals with 16,000 IBM Personal System/2s — intelligent workstations that will be adapted for multiple purposes within the bank. Now shipped to 875 sites, the PS/2s should all be in place by December.



Bankamerica's Simmons
lauds open systems

Simmons' staff now numbers 4,200 employees throughout the bank and its business units. To help him in his efforts, several of his colleagues from Fidelity have since come over to Bankamerica [CW, April 24]. His budget amounts to about \$500 million per year. Inventory includes about 40 large mainframes, most of them IBM or compatibles; about 600 private branch exchanges; hundreds of minicomputers; and thousands of terminals and personal computers.

Hardware, software, networking and databases all should be interchangeable as time goes on, Simmons said. "You want to write to some sort of standard interface that allows you to use any kind of technology. You want to keep the platforms discrete and separate, rather than allowing the platforms to become incestuously involved with a brand name," he said. The basic COIN workstation will be an IBM PS/2 running MS-DOS or OS/2, but Simmons retains the right to add in Unix compatibility or graphics features as end users require.

There should be plenty of choices. That is ensured by Simmons' belief that open systems will give Bankamerica the best ability to support the existing 168,000 computer devices in the bank's global network. To keep things manageable, these end-user choices will fall under a laundry list of approved IS standards.

Another objective for this year is to tie these intelligent workstations together with a corporate backbone network, the California Data Network. Eventually, Simmons plans to put enough intelligence into the network so that users will be able to make queries about account information with little effort.

By using COIN workstations, bank officers will be able to send queries to far-away mainframes even as they are processing loan applications on-screen. But that capability, Simmons said, would depend on IBM and Microsoft Corp.'s OS/2 Presentation Manager and its windowing and multitasking capabilities. Those features will not be installed on the COIN workstations until 1990 or later, he said.

One result of Simmons' open-systems philosophy is that the bank's network nodes need not all be IBM devices just because COIN is based on PS/2s. For example, Simmons said, designers in his group are evaluating Sun Microsystems, Inc. workstations as graphics devices for many bank applications.

As for IBM's Systems Application Architecture (SAA), Simmons, like many other top IS managers, is moving ahead without it: "If you believe IBM's SAA architecture presentation, then you've probably never lived with the disappointment of some things they've announced that didn't work out. I'm more pragmatic. I'd have to say that [SAA] is the right direction, but I'm more inclined to look at the X/Open architecture, at RISC and at open systems architecture in general."

"Simplicity is a great word," Simmons said. "We spend a great deal of time in making things complex. I'm trying to simplify things so that everybody on the team understands the direction."



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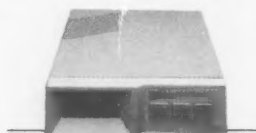
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PRODUCT SPOTLIGHT

NETWORK MANAGEMENT TOOLS

Tool divisions reflect work patterns

BY MICHAEL HURWICZ

Lloyd Smith has an office down the hall from Bob Salzman at General Electric Co.'s Corporate Research and Development Center in Schenectady, N.Y. The two know each other and often rub elbows doing their respective jobs as managers of Communications System Services (CSS) and Distributed Computing Services (DCS). Still, despite physical proximity and their mutual involvement with networks, the two men travel in very different circles.

They oversee different groups. They even keep different books in their offices — Salzman leans more toward technical manuals, Smith toward networking reference books.

The neighboring but separate paths that Smith and Salzman follow are typical of the kinds of dividing lines that are currently drawn in network management.

As manager of DCS, Salzman oversees the logical side of the networks. Smith's CSS group, on the other hand, takes responsibility for the physical side of the network.

The base of the center's operation is an Ethernet network that links eight buildings and supports more than 800 devices, including workstations from Sun Microsystems, Inc. and Apollo Computer, Inc. and IBM Personal Computers and clones. An Apple Computer, Inc. Appletalk network with 225 Apple Macintoshes connects to the Ethernet using Fastpath gateways from Kinetics, a division of Excelan, Inc.

Host computers include an IBM 3081 mainframe, more than 30 Digital Equipment Corp. VAXs, more than 100 Microvaxes and numerous Hewlett-Packard Co. and Data General

Hurwicz is president of the MTI Group, a data communications consulting firm in Nashville.



ELIZABETH SLOTE

Corp. minicomputers. The center is also hooked into GE's corporate Decnet network.

The two groups cooperate, but, Salzman notes, "Clearly there are talents and responsibilities that are uniquely defined in both groups." In fulfilling those responsibilities, each group uses discrete tools to control its specific areas of the networks.

Such fragmentation is not uncommon in communications organizations. Most multivendor networks are managed in bits and pieces. At most sites today,

one management system handles mainframes, another multiplexers, still another modems.

Usually, unless they happen to come from the same vendor, the various management products are incompatible with one another. Each has its own set of commands, formats, messages, protocols and procedures.

At the center, the DCS group uses tools that are either part of the operating system or closely tied to it. Sun machines are managed with tools from Sun; the DEC machines with DEC man-

agement tools; the mainframe with IBM's Netview; and so on.

Similarly, CSS uses vendor-specific software to manage DEC Ethernet bridges, Decnet routers and 3Com Corp. and Proteon, Inc. routers. CSS monitors Ethernet traffic and gathers data with Excelan's Lanalyzer, while an in-house program running on a Sun workstation performs further analysis. CSS also designed and built Ethernet traffic monitors that collect traffic statistics 24 hours a day.

Not only is there a clear division of labor and tools between CSS and DCS, but the management tools within each group are not integrated.

On the DCS side, there is no umbrella management system that handles IBM, DEC and other hosts. Within the CSS area, tools that permit remote management make it possible to physically concentrate network management activities in the

INSIDE

Product Face-Off

How IBM and AT&T interpret net management. Page 92.

First Aid Arrives

AI makes a start on cleaning up network detail. Page 96.

Inside Job

T1 ownership means emulating carrier control. Page 98.

Divisions

FROM PREVIOUS PAGE

network control center — to an extent. This is the case, for instance, with DEC's LAN Bridge 100 and all the routers.

For both staffs, however, most of the real integration among the various network management tools comes in the form of support staff who look at different screens and combine the results in their minds.

Some tools do not even permit remote management. For example, Farallon Computer, Inc.'s Phonet products, all of which are used for managing the Appletalk network, must be installed in the Appletalk "zone" they are monitoring. As a consequence, support personnel must roll a Mac around from zone to zone to use these tools.

"We have a hodgepodge of tools — like just about everybody else does," Smith says.

But as networks grow, hodgepodge net management becomes more difficult. Just installing the tools can become a chore.

For instance, Salzman has bought several network management products from DEC that he has not yet deployed. With massive growth in distributed computing and no growth in support personnel, he is too busy

dismissed quickly because as yet no single tool can handle the management need of a complex, diverse network. And even as these tools evolve, organizations may resist integration. Many firms have spent years developing procedures for using nonintegrated systems and built whole departments around the kinds of divisions that network management products reflect.

In some instances, the idea of integration is forsaken ruefully. In others, companies simply decide they like things as they are and say they would have more use for management tools that streamline existing procedures than one that attempts to radi-

uses Avant-Garde Computing, Inc.'s Net/Alert. T1 circuits and the DCA multiplexers are managed using DCA's Open Network Management System software. Paradyne Corp.'s Analysis package monitors Paradyne modems, attached terminals and multipoint circuits.

Union Trust also divides responsibility for the various types of equipment.

"I build it, and he runs it," is the way John Snopkoski, lead telecommunications analyst at Union Trust, describes his working relationship with Brancato.

To be more specific, the network operations group, with Brancato at its helm, watches over mainframe performance, while Snopkoski's network design group handles the transmission lines and equipment.

Organizationally, the two groups are part of the telecommunications department. Brancato and Snopkoski work in the same network control center — their offices are next to each other's — and they often work closely together. But typically they use different tools and manage different parts of the network.

Brancato's tools tend to be more operational, chosen to supply him with the information he needs to oversee network configurations and locations and to support the people running those installations. Snopkoski is more involved in the actual network design, installation and maintenance.

Network doctors

In fact, growth in network size and complexity appears to be pushing users toward the opposite of the Swiss army knife approach to network management. While waiting in anticipation of an all-encompassing network management system, many companies are developing troubleshooting specialists in various aspects of network support, letting these individuals choose their own task-specific tools.

The philosophy behind this approach is that management tools do not solve problems; the people who wield them do.

"Easily 65%, probably 75% of network problems are solved mainly through experience — you've seen the problem before, and you know the symptoms," says Dan Kohner, a software systems specialist at the M. D. Anderson Cancer Center in Houston. "The most important tool is experience. There is absolutely no replacement for it."

Users say that having cooperating groups and specialists with their unique tools works pretty well. Division of responsibility does not preclude some commonality of tools, however. No matter what your organizational

structure is, users say, integration of management information could be helpful — as long as it is done right and allows for use by cooperating specialists.

Ed Habza, vice-president and senior telecommunications analyst at the National Bank of Alaska in Anchorage, has learned to live with multiple tools. He says he likes the way the division of network management responsibilities works at the bank.

"The flow of work is pretty well-defined here," Habza says,

Telecommunications personnel and to a lesser extent computer operations personnel use a Codex Corp. 9330 network management system to manage Codex modems and statistical multiplexers, as well as attached terminals and ATMs.

Telecommunications has other tools, such as oscilloscopes for monitoring line quality, that computer operations would not use. Similarly, computer operations uses tools that are particularly appropriate to its tasks.

There probably is not a system today that could convince Habza to change the division of labor in network management. It is important, he says, to know "whose court the ball is in."

Still, if a system came out that Habza felt covered all aspects of network management, he would not dismiss it at once. "We would look at it seriously," he says, "especially if it is widely accepted."

So far, nothing has fit that bill.

"I haven't seen one package that covers it all," Habza says. "Usually I find that a tool may do an outstanding job in one area, but it treats other areas as sidelines."

What keeps Habza and other users like him interested, says Cliff Worth, a senior consultant with Arthur D. Little, Inc. (ADL) in Cambridge, Mass., is the hope of reducing staff requirements and making existing staff more productive.

There is, however, still a long stretch between wanting integration and actually getting it. As Worth notes,

establishing a meaningful relationship among disparate tools is still fairly difficult to do. And the chances of finding a system that can do it all are still slim to none. Instead, what most users find are tools that excel at one task.

A number of network management products aim to be full-blown solutions — tools for managing the whole network rather than just a part of it. They may achieve that goal when they mature. As things stand today, however, even the most mature network management products address only parts of the puzzle.

Some tools, for instance, manage one vendor's equipment far better than others. This is especially likely if the management tool is made by an equipment manufacturer. IBM's Netview, for example, is meant to be a multivendor management system. But according to Union Trust's Brancato, Netview

GROWTH IN NETWORK size and complexity appears to be pushing users toward the opposite of the Swiss army knife approach to network management.

cally redefine them.

"I've looked into integration, and I found that I didn't really like it," says Larry Brancato, network operations manager at Union Trust Co. in Trumbull, Conn. He maintains that three separate network management systems may be quite appropriate if three different people are working on three different problems or three different aspects of the same problem.

In fact, that is exactly what

Search and restore

Problem identification and solution top the list of network management features users rate as most important

	Importance (0 = low, 5 = high)
Fault identification	4.5
Restoration of services	4.3
Performance monitoring	4.2
Multiplexer, modem and data set integration	3.6
Configuration management	3.5
Network security management	3.4
Data/voice integration	2.7
Matrix switch integration	2.4
Billing for usage	2.3

SOURCE: TFS COMM/SURV

CW CHART: JOHN YORK

keeping the computers running to install the new packages.

In addition, training support staff to use multiple systems is difficult, time-consuming and costly.

For all of these reasons, the idea of folding multiple management systems into one single package becomes more attractive as networks become more complex. Sooner or later, the thought must cross a network manager's mind that it would be more efficient to have support staff members work with one screen and one set of commands and procedures.

Sometimes that thought is

Union Trust is doing. The bank operates a statewide network connecting 73 bank branches and more than 100 automated teller machines (ATM). Terminals at each branch access an IBM 3083 mainframe running MVS, while Tandem Computers, Inc. TPX computers handle the ATM operation.

Voice and data are multiplexed on a T1 backbone using Digital Communications Associates, Inc. (DCA) multiplexers. Multidrop lines and modems connect the branches and ATMs to the four major network hubs.

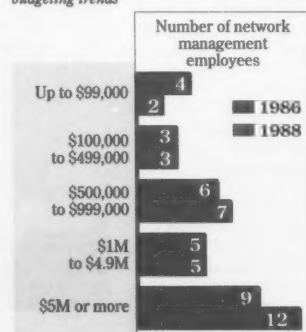
To monitor network device response time, the company

Resource management

Reductions outweighed increases in network management spending at 108 firms surveyed...



... but changes in staffing levels rarely followed budgeting trends



SOURCE: TFS COMM/SURV CW CHART: JOHN YORK

"but we would be interested in a tool that would help us work more closely together."

The bank's IBM 3090 MVS/XA connects to about 450 terminals in 54 branches statewide. The bank runs its own network of approximately 150 ATMs using a Tandem computer. It is also tied into the international Plus ATM network as well as into mainframe service bureaus in a number of cities.

Network support at the National Bank of Anchorage is handled by two groups within the data processing department: the telecommunications group and computer operations group.

The bank also has a systems and programming group, which does not usually handle network support but gets involved with problems that relate to personal computer programs, such as a communications program running on a PC.

works best with IBM products.

"If you have IBM modems, you can use Netview to control them," he says. But for Paradyne modems, which the bank uses, Netview's utility is limited.

However, a number of vendors of non-IBM Systems Network Architecture devices have developed products to interface with Netview via IBM's Netview/PC interface, an OS/2 version that will become available this month. In addition, IBM has not precluded the option of linking directly to Netview, which some people say provides a more functional link but means doing a lot more code writing.

AT&T offers its Unified Network Management Architecture (UNMA) as a platform for integration among AT&T and non-AT&T systems. The company sees Accumaster Integrator, the first piece of UNMA, as a comprehensive network management system. Integrator currently manages a few AT&T systems and works with Cincom Systems, Inc.'s Netmaster network management sys-

NETWORK MANAGEMENT encompasses more than fault management. The OSI model defines four other areas of network management: configuration, performance analysis, security and accounting.

terms of getting its multivendor platform out the door, DEC's eventual products will be far more complete than what AT&T and IBM have out now, according to Bill Gassman, DEC's marketing manager for network management.

Some meaningful steps toward integration are being made, ADL's Worth points out. For example, when it comes to displaying a wide variety of alarms on a

single screen, he says, several vendors are "on the verge of doing it right."

One of the early leaders in doing this is Avant-Garde, which claims that its Net/Command can display alerts from 35 different voice and data monitoring tools. However, Worth points out, Avant-Garde is dealing primarily with fault management information.

Network management, he explains,

encompasses more than that. For instance, along with fault management, the Open System Interconnect model defines four other areas of network management: configuration, performance analysis, security and accounting.

Testing the waters

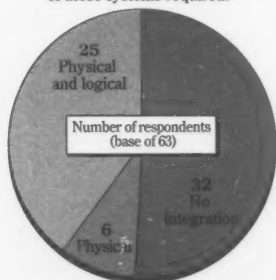
Netview and Accumaster Integrator, as well as EMA and Hewlett-Packard's Openview, were designed to address these other concerns. But these systems are, at best, "just getting their feet wet," Worth says. Most have yet to address a variety of important concerns, such as having to learn multiple sets of commands or dealing with separate databases.

The industry also needs standards for the contents of system management

Missing connections

Integration remains an issue for users with multiple network management systems

"To what degree is integration of these systems required?"



SOURCE: TFS COMM/SURV
CW CHART: FRANK C. O'CONNELL

tem, which in turn provides a way to collect data from Netview. DCA, Avanti Communications Corp. and Newbridge Networks have also announced their intention to support Integrator.

However, the state of Wisconsin, which will soon be testing AT&T's Integrator-based network management service, is planning to have AT&T manage the network but not the computer systems. In fact, according to Tom Alt, director of the Wisconsin Bureau of Information and Telecommunications Management, one of the main reasons for selecting AT&T was that it seemed to offer network consolidation with a minimum of systems changes for the state's agencies, which use IBM, Amdahl Corp. and Unisys Corp. mainframes as well as DEC minicomputers.

DEC is the latest vendor to enter the network management fray with its recently announced Enterprise Management Architecture (EMA). While the only currently available components of EMA are existing DEC network management products, the company has promised by year's end to announce availability dates for an early version of the multivendor system. This system reportedly will provide a common database and common functions such as monitoring, troubleshooting and analysis.

Seven vendors are writing interfaces to EMA, with others to be announced this year, according to DEC. While the company may lag a lap behind other vendors in

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messages. So far, Worth says, standards exist for the envelope (the management protocol) and the mail system (the network transmission service) but not for the content.

Finally, he explains, the new systems do not necessarily make it easier for operators to respond to alerts. That capability may depend on artificial intelligence technologies, which he says will only start emerging in products in the early 1990s.

Neither vendors nor users can hope to fill all these gaps at once, observes Jeremy Frank, program director for enterprise network strategies at Gartner Group, Inc., a market research and consulting group in Stamford, Conn. "We have to walk before we run," he says.

What some people expect when they

hear all the talk about integrated network management are platforms that can effectively embrace the entire spectrum of both networks and systems. That kind of reach is what would most interest Habza of the National Bank of Anchorage, as well as a number of other users.

Worth, for example, describes a client who has mainframe operators and network operators, both working 24 hours a day, seven days a week. When they first put the network people on around the clock, company management asked, "Do we have to have all these people? Can't we combine these operations somehow?"

For the moment, such combinations are not possible. Given both the current pace of network management integration and the present state of organizational

separation between the two areas, it is likely to be quite a while before any span of this type can be achieved.

Some software tools to support integration between the two disciplines may be available in three or four years, Frank says, but that means commercial applications are five or six years down the road. Then, he adds, firms may be able to start thinking about integration on this scale.

The great divide

But before they try to do anything, he cautions, companies should look long and hard at the kind of organizational divide that they will be trying to cross.

The biggest problem is division of expertise. What most firms have now, ADL's Worth says, is a network group

that is responsible for the physical aspects of communications and a computer group that handles operating systems and applications. Even within those groups, people often have very different specialties and cannot substitute for one another.

Integrated network management systems will have to accommodate these differences. According to Frank, they will do so by combining network statistics and alerts with a limited amount of systems information.

All that the umbrella management system needs from the systems side, he says, is "session-trace" information that shows at what point in its processing a system was when it crashed. This makes it possible to roll back the transactions, recover the database and get the system working again quickly.

Session-trace information from different systems will be fed into integrators in standard formats, he says, such as those of the Common Management Information Services/Protocol of the OSI model.

Other aspects of systems management, such as change and asset management, can stay within the system group, and no one else needs to worry about them.

As improved integrated network management systems do arrive, they will find some users waiting with open arms. But questions remain: Will users be willing to alter their organizational structures to match the design of an integrated product? Or will vendors need to offer users the flexibility to employ integrated management tools in nonintegrated or partially integrated organizations?

At least in the short term, the second choice seems more likely. When AI tools and techniques become more prevalent and sophisticated, it may be possible for a single operator to handle a wider range of network management tasks. At that time, it may also become possible to combine system and network management to a greater extent at the organizational level.

Until then, users are looking for only as much integration as they can get without disrupting their established structures for network and systems management. •

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**Robert Thrasher
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PacifiCorp Financial Services**

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Two versions of one story

BY ATUL KAPOOR

IBM's Netview and AT&T's UNMA/Accumaster tackle the role of network management environment in very different ways. Each reflects the strengths and cultural biases of its parent.

With Netview, IBM approaches network management from the mainframe side, focusing on customer-premises equipment (CPE). AT&T, on the other hand, represents a traditional, common-carrier view with its Unified Network Management Architecture (UNMA) and its Accumaster products.

Historically, IBM's strategy has been simple: It tried to provide all the elements in a customer's network. What it could not supply, it pretended did not exist or was not important. What it did provide, it managed using IBM's own proprietary host-based management systems.

Even today, IBM Systems Network Architecture (SNA) networks will allow only centralized, host-based communications network management (CNM) through Netview, its centralized management application — also known as the network management focal point. Netview requires VTAM on the host for its CNM functions.

But while this strategy has been successful with simple networks, it is becoming difficult to maintain as network requirements grow more complex and include non-IBM management systems.

For instance, session protocols for CNM data collection, already proving inadequate, are due to be replaced by more complex LU6.2 session protocols. In addition, the CNM data structures, a compendium of diverse data structures patched year after year as new requirements were recognized and understood better, are still evolving.

A disciplined view

AT&T takes a more serious and disciplined view of the term "architecture." It also takes a different, broader view of the management process.

Because of regulatory and product constraints, AT&T had to learn to exist and manage in hybrid environments. The company has benefited from these constraints by not having a large embedded product base supported through any single unified system.

Freed of such encumbrances, AT&T has come up with a distributed, decentralized architecture — UNMA — the primary focus of which is the integration of independent and sometimes mutually hostile management systems.

UNMA is a three-tiered structure. At the lowest level are the network elements, which include CPE, local exchange carrier- and interexchange carrier-provided services. In the middle are one or more element management systems (EMS), possibly from different vendors and supporting different architectures.

At the highest level is an integration system that pulls together the management functions from all EMSs. AT&T's Network Management Protocol (NMP), which defines the flow between the inte-

gration system and the EMSs, is based on the Open Systems Interconnect (OSI) reference model. AT&T has committed to modifying NMP if it differs from the final OSI specification.

To some extent, comparing Netview and Accumaster Integrator is like comparing apples with oranges. Netview is an SNA element management systems first and an integrator second. The Accumaster Integrator is primarily an integra-

tor; it depends on individual EMSs to manage their own elements.

For pure SNA networks, Netview is perhaps the best solution because it manages both network and host systems. Its only competitor would be Cincom Systems, Inc.'s Net/Master — not AT&T's Accumaster Integrator. However, rarely is a network purely IBM, and that makes this comparison worthwhile.

Netview's strength lies in its interaction with network management functions in other IBM products, such as detailed alarms and error codes, response-time statistics and remote testing. It can track the probable cause of problems, recommend recovery actions and assist in logical problem de-

termination. It can also automate network alarm handling and, with proper training and expertise, be customized extensively.

Netview is also supplemented by additional products for performance analysis, file and software distribution and remote processor operation. Finally, it has been validated in very large networks and has a proven track record.

However, for large multivendor networks, IBM allows multiple focal points only if implemented through additional Netview programs or, possibly in the future, through another IBM product such as Application System/400 — but never through a non-IBM management system.

SNA does provide the concept of a "service point" as a gateway to integrate

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Kapoor is a principal of Kaptronix, Inc., a Hawthorth, N.J., consultancy specializing in SNA and network management.

non-SNA management systems. However, Netview recognizes this point not as a management system but as simply another network element. The actual service point implementation, through its Netview/PC gateway, supports an alarm structure that is sophisticated but difficult to put to use.

By contrast, the Accumaster Integrator excludes nothing. It focuses strictly on value-added integration without discriminating between AT&T and non-AT&T products. One example of this is alarm correlation, whereby the Integrator can correlate multiple alarms resulting from a single failure to a specific higher level network component and report only that one failure accurately.

In addition, in EMSs with automatic

BOOTH ACCUMASTER AND NETVIEW lack comprehensive reports for network planning and trend analysis. Neither currently can provide a seamless integrated solution, nor can they incorporate expert systems.

restoral capability, the Integrator can help automate recovery by reporting restoral of a resource to other dependent systems so that they can automatically restore their services.

For SNA users, AT&T provides all of the Netview functions simply by adopting Netview as one of its middle-tier EMSs through its connection with a separate Cincom-provided host-based SNA Man-

agement Application. This interface passes to Accumaster Integrator whatever management data goes to Netview.

Accumaster Integrator is equally useful in both IBM and non-IBM networks. For both types of networks, it can exploit the capabilities of other EMSs using additional gateways. No gateway is required if the EMS supports NMP. For its own network elements, AT&T provides EMSs

with built-in interfaces to the Integrator.

For operational control, the Integrator provides direct access to EMSs from a single terminal with its "cut-through" feature, which allows users to log on to any IBM 3270 or Digital Equipment Corp. VT100 interface-supporting EMS as a control operator and run a concurrent window for each EMS. Netview provides a somewhat more primitive command interface to EMSs through its Netview/PC product.

In terms of graphics, AT&T clearly holds the advantage. Its workstation provides powerful graphics and can display a complete physical view of the network — something that IBM does not yet provide.

For other network management requirements — such as management of problems, change, inventory, accounting and security — are concerned, AT&T has a broader scope of definition. But while neither of the two provides a complete implementation, IBM's implementation is much more complete.

Analyses equating Netview with logical resources management and Accumaster Integrator with physical resources management are becoming irrelevant, because each solution can accommodate both levels of management.

Cooperative roles

Netview is evolutionary — it has to worry about compatibility with the embedded base of products. Accumaster can be revolutionary — it can let the EMSs carry the baggage so long as the integration interface is clean and efficient, as early reports indicate it is.

Both products are good at what they do. Their roles are cooperative rather than mutually exclusive. But neither is complete by itself, nor can either eliminate or replace EMSs or provide intelligence to a dumb element or EMS.

Both products lack comprehensive reports for network planning and trend analysis. Neither currently can provide a seamless integrated solution, nor can they incorporate expert systems.

To do this, what is needed is a common management architecture, such as OSI, supported by all EMSs — a need that AT&T is currently much better positioned to benefit from than IBM. •

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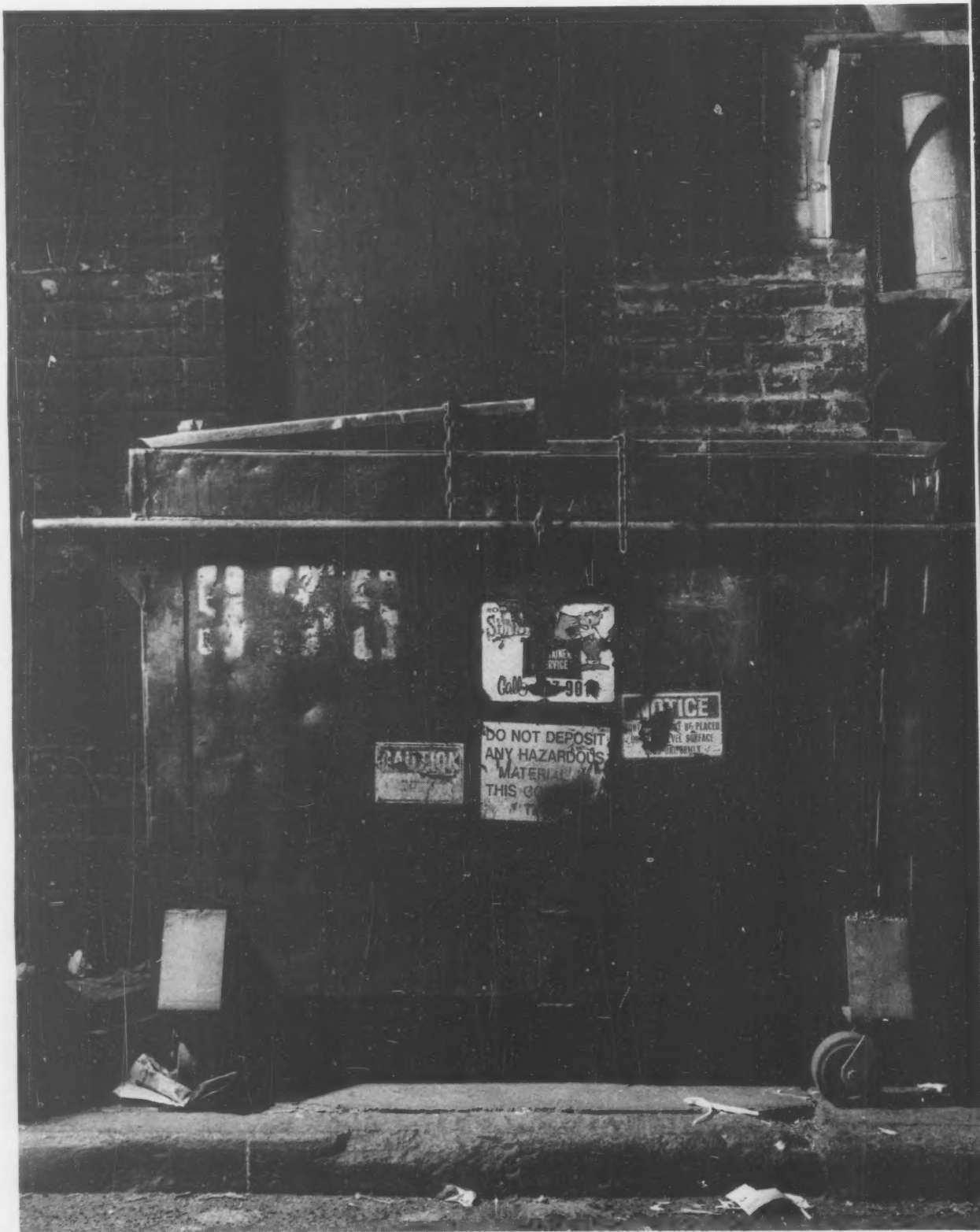
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Finally, AI to the rescue

BY GILBERT FALK

Network managers are trapped in an unpleasant spot, buried under an avalanche of network complexity with not enough hands to dig them out. They have been in this quandary for a while, listening to the faint shouts of promised rescue from the artificial intelligence laboratories.

Now, however, some tools are beginning to address the problem. It may take a few more years before the rescue is completed, but now that expert systems and intelligent systems technology are show-

ing up on-site, users have reason to hope.

Network managers are in a fix: Networks have become so complex in terms of functionality, protocols and interconnectivity that few people, if any, understand the behavior of large configurations or are capable of interpreting the volume of imperfect management data spit out by individual network elements.

Certainly, there are not enough of these individuals to support network operations around the clock. And, even if ap-

propriate network support personnel could be hired, the random arrival of time-critical network faults can easily overwhelm the staff in certain situations.

Eventually, expert systems will be able to take over much of the drudge work from the operations and support staff. These systems could scan tirelessly, in a way that no human could, for important patterns in network management data. Although that time is not here yet, enough working products are available to make this scenario no longer seem like a pipe dream.

Right now, the most common use of AI in network management involves the application of rule-based expert systems for fault diagnosis. Automated alarm diagnosis, a subset of fault diagnosis, is a com-

mon application of current network-oriented, rule-based expert systems.

The recently announced AT&T Accumaster Integrator product, for example, consolidates alarms generated by several underlying element management systems and uses an expert system to identify the most likely problem along an end-to-end network path.

Another area in which AI technology will become more prevalent in the future is network layout design.

Current AI-based network layout tools use knowledge-based systems techniques to represent definitional and structural information about the network environment. They combine deterministic algorithms with rules of thumb to capture the way expert network designers work.

Future AI-based network layout tools

EVENTUALLY, expert systems will be able to take over much of the drudge work from the operations and support staff.

will take greater advantage of more sophisticated AI search techniques. In addition, network layout tools will be integrated with AI-based product configuration tools to automate a larger portion of the overall network design task.

Theory and fact

Network management systems will increasingly use AI technology to support mixed-initiative operations in which the system supports expert decision making. This will be more viable when current rule-based systems are melded together with more powerful model-based reasoning systems. Future expert systems, based on a more complete representation of the application domain, will provide both a theoretical understanding of the system and standard rules of operation.

Automated network experts can be developed to monitor and control network operation in real time. Such systems can be viewed as expert system extensions to existing dynamic routing and congestion-control algorithms.

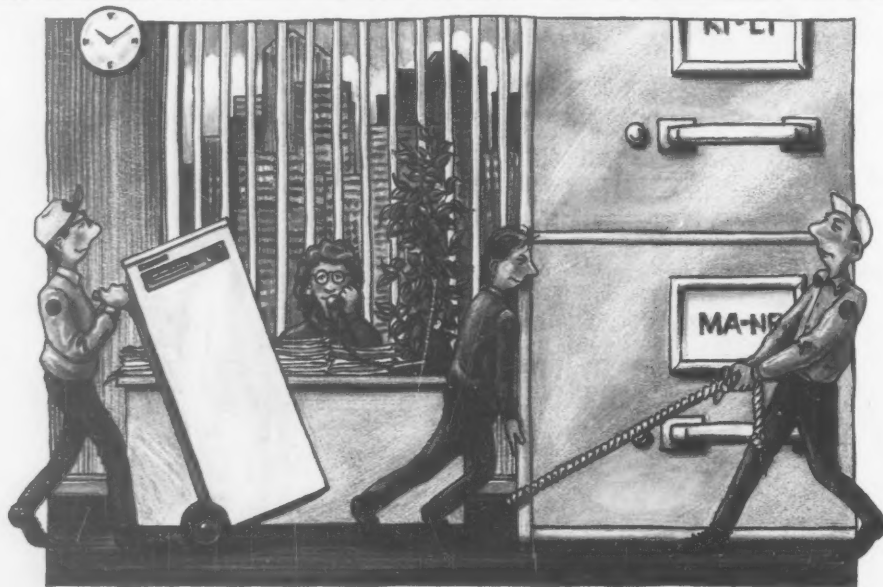
In the next five years, the implementation of expert systems on a variety of conventional hardware platforms will increase. Delivered as embedded components, AI-based network management tools will run in conjunction with conventional software on Digital Equipment Corp. VAXs, for example, or on existing systems in the network management center.

Regionally distributed expert systems will become more common, sharing information between, say, a fault-diagnosis system in San Diego and a performance-analysis system in Boston.

Most importantly for overburdened network managers, prototype expert systems have already demonstrated their ability to integrate and interpret network management data in the laboratory, and this means that products with this capability cannot be far off.

After years of hearing about AI's potential, network managers can finally be assured that help is on the way. •

Falk is principal consultant with the Telecommunications Consulting Group of BBN Communications Corp. in Cambridge, Mass.



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SEE US AT TEXPO '89 BOOTH #308

You're on your own with T1 net

BY TIMOTHY G. ZERBIEC

T1 backbones give corporations great flexibility for linking business locations.

Once installed, these high-bandwidth transmission facilities allow users to support voice and data applications without the delay of ordering, scheduling and installing individual common-carrier-supplied circuits.

Independence has a price, however. Firms choosing this route must also take responsibility for ensuring the availability of their T1 networks and the applications they carry.

If a corporation wants to operate its own transport network, it must emulate the round-the-clock monitoring and management that the carriers provide for their networks. The fact that all corporate T1 networks are enterprisewide networks, simultaneously supporting applications from multiple departments, compounds the task.

Zerbiec is a principal and vice-president of technology at Vertical Systems Group, a Dedham, Mass., consulting firm specializing in communications.

Fortunately, T1 multiplexer manufacturers have taken steps to simplify these management tasks. Most multiplexers now include network management tools to detect and diagnose failed transmission elements, correcting some automatically and alerting operators so that they can determine whether a manual correction is required.

Automated functions

At present, these multiplexers use software running on microprocessors in system logic to intelligently control applications availability. They automate operations functions such as circuit path selection, traffic rerouting after T1 line failure and bandwidth contention.

Built-in test aids continuously monitor the status of channel and trunk interfaces as well as the health of multiplexer system logic. Control lead status, VF levels, loopbacks and T1 facility alarms are among the many test capabilities available.

User interfaces for these systems vary. At the low end, net-

work management systems based on CRTs provide alarm displays. At the high end, most workstations use color, graphics and databases to improve operator responsiveness.

When evaluating T1 multiplexer vendors, users should model the proposed network topology and measure the performance of each product as it relates to the applications environment. For example, a network model simulating the loss of a T1 internodal line could show the time required by each multiplexer to reroute the network's application channels.

During the shopping process, users should also find out how the network management systems from T1 vendors being considered interface, or will interface, with management environments such as Open Systems Interconnect (OSI), IBM's Netview, Digital Equipment Corp.'s Enterprise Management Architecture (EMA) and AT&T's Unified Network Management Architecture (UNMA).

For the next several years,

none of these architectures will replace the individual T1 multiplexer vendors' proprietary network management systems, but each proposes a method for supporting T1 backbones and it is important to know the extent to which the T1 vendors in question are implementing interfaces to environments that could be a major factor in your future.

Holding back

For instance, all the T1 multiplexer vendors say they are planning to implement interfaces to OSI, which promises network interoperability. However, it is more likely they will hold back in delivering them, using these interfaces like a marketing trump card to use when other vendors' delivery plans are clear.

Similarly, while DEC's EMA will integrate multivendor environments into a single applications support format, vendor cooperation and implementation could be slow in coming.

Intelligent multiplexers are not alone in improving network operations activity. Other elements of the transmission path can also provide network management support.

Channel service units (CSUs) provide the physical interface between the carrier-provided T1 line and the customer's

equipment. The CSU also passively monitors the signal to identify improper signal formatting by the user's equipment and loss of signal from the transmission facility. With availability of T1 framing formats such as Extended Superframe Format, CSUs can also provide details about the signal quality on the T1 line.

CSU-monitoring functionality is available in a stand-alone mode, or it can be integrated into the multiplexer's network management system.

CSUs integrated into the T1 multiplexer network management have the advantage of using the same operator interface and event-capture system used for multiplexer alarms. This permits the operator to quickly see relationships between loss of applications connectivity and network events. It also speeds problem isolation for elements in the transmission path.

Network management can be expensive if your T1 network is extensive, but it is necessary. Evaluate the options carefully, and opt for feature and functionality that will streamline your operations environment. Considering the cost of lost revenue from inaccessible applications, T1 network management seems like a bargain. •

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SNA Network Management
T1 Network Management

Integrated and Automated Network
Management
LAN Management

Get hands-on information from leading vendors at our demonstration suites

Starting Tuesday afternoon, and continuing through Thursday, you will have the opportunity to visit demonstration suites provided by our sponsors. Talk to technical experts, and get hands-on demonstrations of products from leading vendors, including DCA, Digital Equipment Corp., Hewlett-Packard, US WEST Network Systems, Inc. and more.

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Our conference sessions will give you a chance to learn the latest about a variety of current networking topics ranging from "User Administration" to "Progress toward OSI."

Sponsor Briefings

Save time and effort by learning current network management solutions from key industry players such as Northern Telecom, StrataCom, Inc. and Timeplex, Inc. These sessions, spread throughout both days, will deliver maximum information in a minimum amount of time.

WEDNESDAY, JUNE 21

Industry News and Announcements

Keynote Address

By Mark Teflian, Vice President for Technical Planning and System Engineering, Covia Corporation

Real Time Management

Implementing the Standards —
Progress toward OSI

LAN Management

The Next Five Years: Technology Forecast

THURSDAY, JUNE 22

IBM NetView PC Products

Packet Network Management

TCP/IP Network Management

Expert Systems/AI-based Network Management

Managing IBM Networks without NetView

User Administration

User Experience Panel

In a fitting program finale, actual case histories of successful network management implementation will be presented by the winners and runners-up for the *Network World* NMS Award.

Conference presenters

Network World is the leading newsweekly for communications executives and professionals at organizations using voice, data and video communications.

OSI/Network Management Forum is a global consortium developed by 13 major worldwide computing and communications organizations to accelerate the introduction of compatible network management products. The members of OSI/Network Management Forum endorse the international standards model known as Open Systems Interconnection (OSI) for simplifying the management of multi-vendor networks for voice and data communications.

Voting Members are Amdahl Corp., AT&T, British Telecom, Digital Communications Associates Inc., GEC Plessey Telecommunications Ltd., Hewlett-Packard, MCI Telecommunications, MicroTel Ltd., Nippon Telegraph, Northern Telecom Inc., STC PLC, Telecom Canada, and Unisys Networks.

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Schedule and pricing summary

Dates: Tuesday, June 20 through Thursday, June 22, 1989

Location: The Swiss Grand Hotel, 323 East Wacker Drive, Chicago, IL

Schedule: All-Day Tutorials: Tuesday 9:30 A.M.-4:30 P.M.

Conference: Wednesday 8:00 A.M.-5:15 P.M., Thursday 8:30 A.M.-4:15 P.M.

Demonstration Suites: Tuesday 4:30 P.M.-6:30 P.M., Wednesday 10:00 A.M.-6:00 P.M., Thursday 10:00 A.M.-4:00 P.M.

Registration Fees: Full Conference Registration: \$625 per person. One-Day Tutorial only: \$395 per person. Two-Day Conference only: \$395 per person.

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CWB

Multivendor network management systems

COMPANY	PRODUCT	HARDWARE OR SOFTWARE	NUMBER OF LINKS WITH OTHER NETWORK MANAGEMENT SYSTEMS	PROPRIETARY OR NONPROPRIETARY LINKS	HARDWARE PLATFORM	TYPE OF NETWORKS MANAGED	ALARM MONITORING	TRAFFIC MONITORING	REALTIME NETWORK STATUS MONITORING	CAPACITY PLANNING CAPABILITIES	REBARS SUPPORTED	REMOTE FACILITY TESTING	LINK-LEVEL DISPLAY AND DIAGNOSTICS	RESOURCE UTILIZATION ANALYSIS	CONFIGURATION MANAGEMENT	SECURITY AND ACCESS CONTROL	CHARGEBACK AND BILLING	WORKSTATION FEATURES	PRICE
ADC Telecommunications, Inc. (612) 835-6900	NUMARC	Both	None	NA	IBM PC/XT/AT, PS/2 and compatibles	Dial-up, leased lines, non-communication alarm devices	Yes	Yes	Yes	Database of historical usage, utilization management reports	Database	Yes	No	Yes	No	Yes	No	Color graphics, windowing, help screens, audible alarms	Up to \$130 per port
Advanced Computer Communications (800) 444-7854	ACS 4110 Remote Ethernet Bridge	Both	3	Own	Proprietary	Local, remote LANs (802.3)	Yes	Yes	No	No	None	Yes	Yes	Yes	Yes	No	No	None	\$7,500
Asadul Corp. (408) 493-1077	Network Processor Series/2705 Management Systems Model 106	Software	None	NA	IBM AT and compatibles	T1, X.25, SNA	Yes	No	Yes	No	None	No	Yes	No	Yes	Yes	No	None	\$2,000 and up
	Network Processor Series/2746 Management Systems Model 206	Software	2	Own	Sun workstation	T1, X.25, SNA	Yes	Yes	Yes	Modeling	Informix	Yes	Yes	Yes	Yes	Yes	Yes	Yes	\$27,000 and up
Amnet, Inc. (508) 879-6306	Nucleus 7000 Series	Both	Approx. 50	Own	IBM AT and compatibles	X.25 (local and remote)	Yes	Yes	Yes	None	Proprietary	Yes	Yes	Yes	Yes	Yes	Yes	Color graphics	\$3,950-\$45,000
Applied Computing Devices, Inc. (812) 232-6051	ACD Network Knowledge Applications	Both	18	Own	Any Unix-based system	Voice or data	Yes	Yes	Yes	Simulation, modeling	Any SQL database including Oracle	Yes	Yes	Yes	Yes	Yes	Yes	Color graphics, windowing, zoom, mouse, template capabilities for graph/text displays, expert mode	\$80,000 and up
AT&T (800) 247-1212	StarGroup Software Network Manager	Both	None	NA	AT&T 6386 WGS	AT&T Starlan, Starlan 10, Ethernet running StarGroup software	Yes	Yes	Yes	No	Informix	Yes	Yes	Yes	Yes	Yes	No	Color graphics, menus	\$2,895
	Accumaster Integrator	Both	22	Other	AT&T 3B2/600, Accumaster high-resolution workstation	LAN, WAN, SNA, modems, DSUs, T1/stat muxes, PDIs, analog, digital, switched, packet, satellite, SNA sessions	Yes	Yes	Yes	No	Informix	Yes	Yes	Yes	Yes	Yes	No	Color graphics, windowing, zoom, mouse, help screens, multilayered network maps	Approx. \$250,000
Atlantic Research Corp. (703) 644-9190	NTS 3000 Network Restoration, Test and Management System	Both	1 actual, 3 announced	Own	Any 80386-based PC	Any WAN	Yes	Yes	Yes	None	No	Yes	Yes	No	Yes	Yes	No	None	NP
	NTS 4000 Distributed Network Restoration, Test and Management System	Both	1 actual, 3 announced	Own	Any 80386-based PC	Any WAN	Yes	Yes	Yes	None	No	Yes	Yes	No	Yes	Yes	No	None	NP
Avante-Garde Computing, Inc. (609) 778-7000	NetCommand	Both	35+	Own	Sun workstation	Any multivendor	Yes	No	Yes	None	Sybase	Yes	Yes	Yes	No	Yes	No	Color graphics, windowing, icons, mouse, menu, concurrent sessions	NP
	NetAlert Plus	Both	None	NA	Concurrent 3200 series	Leased-line, boundary	Yes	Yes	Yes	Displays utilization of device	None	Yes	Yes	Yes	Yes	No	No	Color graphics, menu, color icons	Approx. \$80,000
Avanti Communication Corp. (401) 849-6660	Open Network Management	Both	2 announced	Own	Sun workstation	ONX	Yes	Yes	Yes	None	Oracle	Yes	Yes	Yes	Yes	Yes	In R&D	Color graphics, windowing, zoom, mouse	NP
BRN Communications Corp. (817) 873-3038	C7, C70 NOC, T70, T700 CSM	Both	One	Own	DEC Microvax	X.25 packet switching, circuit switching	Yes	Yes	Yes	Trend analysis	Ingres	Yes	Yes	Yes	Yes	Yes	Yes	Color graphics, windowing, zoom, mouse, menu-driven commands, VT100 emulation	Starts at \$75,000
BGS Systems, Inc. (817) 881-0886	Bestnet Boundary; Bestnet MSNP	Software	3	Other	IBM and plug-compatible mainframes	SNA	No	No	No	Modeling	None	No	No	Yes	Yes	No	No	Graphics, zoom	NP
Cabletron Systems, Inc. (603) 332-9400	Remote Lanview	Both	NP	Other	IBM AT and compatibles, proprietary	Ethernet	Yes	Yes	Yes	None	None	Yes	Yes	Yes	Yes	Yes	No	None	Starts at \$1,995
Cisco Systems, Inc. (800) 543-3810	Net/Monitor	Software	750	Own	IBM 370 and PCMC, 9370, 3090, 3090 series	SNA	Yes	Yes	Yes	No	None	Yes	Yes	Yes	Yes	Yes	Limited	None	\$10,000-\$140,000
Clear Communications Corp. (312) 293-0750	Clearview T1 Surveillance System	Both	NP	NP	Sun 386i workstation	T1	Yes	No	Yes	No	Ingres	Yes	Yes	Yes	Yes	Yes	No	Color graphics, windowing, zoom, mouse, pull-down menu commands	\$49,950
Codex Corp. (800) 426-1212, Ext. 7230	9300	Both	1 actual, 1 announced	Own	HP Vectra, all 80286- and 80386-based PCs	Modems, STDM, DEC TDM, T1, DSU/CSU, X.25	Yes	Yes	Yes	Gathers statistics	Reflex for reporting only	Yes	Yes	Yes	Yes	Yes	No	Color graphics, windowing, zoom, mouse, graphical typography	\$13,000-\$30,000
	9800	Both	2 announced	Own	33-bit engineering workstation	Modems, STDM, DSU/CSU, TDM, T1, X.25	Yes	Yes	Yes	Gathers statistics	Reflex and Domsle Dialog for reporting only	Yes	Yes	Yes	Yes	Yes	Yes	Color graphics, windowing, zoom, mouse	\$45,000+

The companies included in this chart responded to a recent telephone survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

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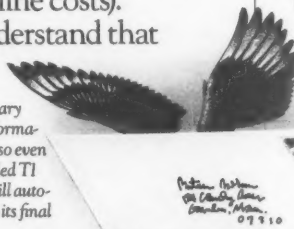
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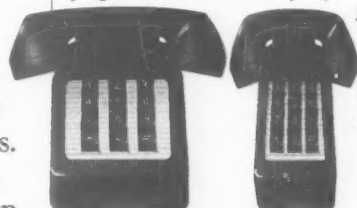
the lifeblood of your network flows through your T1 links. So the Codex 6290 employs a revolutionary high speed packet technology, specifically designed to keep even the most complex network up and running under critical conditions.

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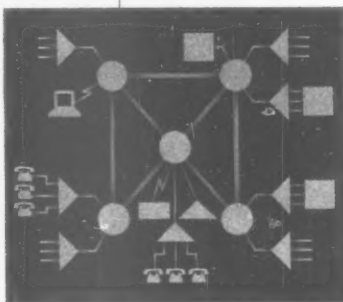
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ficing voice quality. That translates into savings often exceeding 30% in T1 line costs.

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*Left to Right:
Deron Kahn,
Executive Vice President, Sterling Optical*

*Richard Letourneau,
AT&T Data Sales Executive*

*Robert S. Smith,
Chairman and CEO, IPCO Corporation,
President, Sterling Optical Division*

Chesterfield, Missouri February 28, 1989

Sterling Optical, one of the leading optical chains in the country, was looking for a way to get a jump on their competitors in the retail eyeglass and eyecare marketplace. Sterling Optical's Bob Savin, Daron Kahn and AT&T's Rich Letourneau discuss how AT&T developed an open systems-based, retail point-of-sale system to network their 250 stores nationwide.

Sterling: We were getting frustrated by the delays we were facing with the old way of doing things. Our customers were unhappy, we were unhappy, and headquarters wasn't able to keep up with the volume of requests. We knew a highly integrated distributed networked computing solution was the only way to go.

AT&T: And you wanted to preserve the investments you'd already made in applications software—especially those on the System/38.

Sterling: Absolutely. All our RPG-coded customer records and our inventory control system are stored in the database at headquarters. The retail business is demanding—you can't afford to wait to implement brand-new technology. Plus, we don't have a very large computer programming department, and in order to develop, modify, or change corporate programs on the System/38, it's a big effort, and it takes a lot of time.

AT&T: That's why we built our multiuser platform based on the UNIX® System V operating system. We gave you the tools to develop new applications and get them into the mainstream of your business quickly.

Sterling: It made sense. We were able to keep our hardware and software and install AT&T 6386 WorkGroup Systems in our stores. Now, on a daily basis, we know what's selling and what's not. We even included an employee time and attendance system that feeds into our existing payroll system.

AT&T: And you've kept your system options open. You can modify any part of the

system at any time. Like when you added the automatic pricing software.

Sterling: Right. I think what we like most about the system is its simplicity. Despite the complexity of the information handled, it really gives us easy access to our information. We need that to improve the profit potential of our business, and to maintain our lead in the industry.

AT&T: The system also provides investment protection for what you have today, and a gradual growth path to what you'll need tomorrow.

Sterling: One of the most striking things was AT&T's commitment to service. We came from an environment where it wasn't uncommon to be down for two to three or four days, waiting for equipment to be shipped or repaired.

AT&T: Our message was simple: AT&T wants your business.

Sterling: You were here working as much as we were. And you really listened to us. Of all the vendors we spoke to, you gave us the best proposal, the best equipment, and the best price. In fact, we're so excited about the new system, we wrote it up in our company newsletter.

AT&T: I heard! Can we get a copy?

Sterling: Sure. The only catch is, you have to read it from across the room with one eye closed.

The Sterling Optical Computer Solution:

THE CHALLENGE

Create a point-of-sale computer system specific to the optical retail business for the 250-store nationwide Sterling Optical chain.

THE SOLUTION

AT&T created a UNIX System V-based network of AT&T 6386 WorkGroup Systems and AT&T 605 terminals chain-wide. At headquarters, an AT&T 3B2/500 gathers orders and information from each store daily. The system allows a smooth link between the 3B2/500 computer and the existing IBM System/38. A custom INFORMIX database management system forms the heart of the applications software.

THE RESULT

Sterling Optical customers are getting better service. All store locations will be using one standard point-of-sale system that provides increased productivity, a friendlier working environment, and greatly enhances Sterling Optical's competitiveness in the industry.

Call your AT&T Account Executive, AT&T Authorized Reseller or 1 800 247-1212, Ext. 530.

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For once, a micro-to-mainframe link that will cure your fear of mice.

It's called MacMainFrame™.

A totally transparent Macintosh®-to-IBM® mainframe connection that gives each one of your Macintosh

users access to all the corporate data they need to excel in their job. While giving you the flexibility you need to excel in yours.

For one thing, MacMainFrame is as easy to learn and as easy to use as the Macintosh itself. So there's no training for you to worry about.

With extensive security features, MacMainFrame lets you decide precisely who can and who can't get into your data. Which information is accessible and which isn't. So you don't have to worry about your mainframe being – if you'll pardon the expression – overrun with mice.

Plus, MacMainFrame supports every Macintosh from the 512Ke to the Macintosh II. It's affordable.

It works with IBM IND\$FILE. It's even available with an optional Application Programming Interface.

And it's all backed up by the Avatar® service and support network. One which our competition, with all due modesty, would be hard pressed to duplicate.

If you'd like the name of the authorized MacMainFrame dealer nearest you, call 1-800-289-2526, extension 28. Or write Avatar Corporation, 65 South Street, Hopkinton, MA 01748. Admittedly, you could give your Macintosh users something less than MacMainFrame. But wouldn't that be just a little bit scary?

Avatar

Now Macintosh II users can run up to five host sessions simultaneously with MacMainFrame/DFT.

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NETWORK MANAGEMENT TOOLS

PRODUCT SPOTLIGHT

COMPANY	PRODUCT	HARDWARE OR SOFTWARE	NUMBER OF LINKS WITH OTHER NETWORK MANAGEMENT SYSTEMS	PROPRIETARY OR NONPROPRIETARY LINKS	HARDWARE PLATFORM	TYPE OF NETWORKS MANAGED	ALARM MONITORING	TRAFFIC MONITORING	REALTIME NETWORK STATUS MONITORING	CAPACITY PLANNING CAPABILITIES	FORMATS SUPPORTED	REMOTE FACILITY TESTING	LINK-LEVEL DISPLAY AND DIAGNOSTICS	RESOURCE UTILIZATION ANALYSIS	CONFIGURATION MANAGEMENT	SECURITY AND ACCESS CONTROL	CHARGEBACK AND BILLING	WORKSTATION FEATURES	PRICE
Communications Devices, Inc. (201) 772-6997	Network Windows	Both	1 announced	Own	Any MS-DOS machine	Any dial (modem)	Yes	Yes	Yes	Usage reports	Proprietary	Yes	Yes	Yes	Yes	No	No	Color graphics, pull-down menus	Approx. \$11,900
Computer Associates International, Inc. (516) 227-3300	CA-Madamon	Software	None	NA	IBM running MVS, all Amdahl	IBM/VTAM	No	Yes	Yes	No	None	Yes	Yes	Yes	Yes	No	Yes	Color graphics, reporting	\$26,900-\$67,200
Connections Telecommunications, Inc. (508) 584-8885	Network Design Series	Software	NP	Own	IBM PC and compatibles	WAN, switched networks	No	No	No	Modeling, topology design, response time analysis, circuit pricing	Microm R-Base Series 5000, Gupta SQLBase	No	Yes	Yes	Yes	No	Yes	Color graphics, windowing, zoom, mouse	\$16,000-\$18,000
Contel Business Networks (301) 520-6400	Contel Manager Plus	Both	None	NA	DEC VAX	Proprietary, Intecom Lanmark	Yes	Yes	Yes	Switch traffic reports	None	Yes	Yes	Yes	Yes	Yes	Yes	Color	Approx. \$10,500 and up
Cosmic, the University of Georgia (404) 542-3365	Network Queuing Systems (ARC-11750)	Software	NP	Other	Any running Unix	Any Unix-based system	No	Yes	Yes	None	None	Yes	No	Yes	Yes	Yes	Yes	None	\$6,000
Data General Corp. (800) 328-3436	Open Network Management System	Software	Any Open Network Management Foundation member	Own	Eclipse MV family	LAN, X.25 WAN, SNA	Yes	Yes	No	None	DG/SQL	Yes	Yes	No	No	Yes	No	Menus	\$300-\$1,200 per node
Data Switch Corp. (203) 926-1861	Totalnet	Both	Unlimited via emulation	NA	Unix-based	Data Switch DSM Matrix Switches, Intelligent Performance Measurement systems	Yes	Yes	Yes	None	Proprietary	Yes	Yes	Yes	Yes	Yes	No	Color graphics, windowing, zoom	Up to \$200,000
Datacomm Management Sciences, Inc. (203) 838-7183	MTRX Series	Both	1 actual, 2 announced	Both	IBM AT, PS/2 and compatibles, proprietary	WAN	Yes	No	Yes	No	Dbase	Yes	Yes	No	Yes	Yes	No	Color, function keys, menus, expert mode	\$300-\$400 per port
	NSM-64	Both	1 announced	Own	IBM AT and compatibles, proprietary	3270 interactive WAN	Yes	Yes	Yes	No	Dataflex	Yes	Yes	Yes	No	No	Yes	Color, menus	\$1,000-\$3,000
Digilog, Inc. (215) 628-4530	Network Analysis & Management Systems (NAMS)	Both	None	NA	DEC VAX	WAN	Yes	Yes	Yes	None	None	Yes	Yes	Yes	Yes	Yes	No	Color graphics	\$30,000 for software
Digital Equipment Corp. (800) 344-4825	Ethernit	Software	NP	Industry-standard links	DEC VAX	Ethernet, IEEE 802.3	Yes	Yes	Yes	None	RMS, Datatrieve	No	Limited	Yes	Yes	No	No	Graphics	\$9,370
Dynastech Communications, Inc. (703) 550-0011	Prism	Both	2	Own	IBM AT, PS/2 and compatibles	WANs, packet switching, X.25	Yes	Yes	Yes	Modeling, simulation, performance measurement	NP	Yes	Yes	Yes	No	Yes	No	Color graphics, mouse, zoom, Presentation Manager	\$10,000-\$20,000
General Datacomm, Inc. (203) 574-1118	Megview	Both	2 actual, 2 announced, plus any that can support ASCII connection	Both	Sun 386i	Modem, Digital, TDM, STDAM, Packet ISDN, T1	Yes	Yes	Yes	Modeling, simulation	Informix	Yes	Yes	Yes	Yes	Yes	No	Color graphics, windowing, zoom, mouse, color monitor, color printer/plotter	\$36,395-\$160,000
Hewlett-Packard Co. (800) 752-0900	HP Openview	Both	8 actual	Both	Any DOS-based system	OSI, TCP/IP	Yes	Yes	Yes	NP	Proprietary	Yes	No	No	No	No	No	NP	NP
IBM Contact your local IBM sales office	Netview/PC	Software	28 actual, 27 announced	Both	IBM 370, PC/XT/AT, PS/2	SNA, OSI, X.25, LAN, Non-SNA	Yes	Yes	Yes	Provides SMF records	None	Yes	Yes	Yes	Yes	Yes	Yes	Color graphics, windowing, mouse, concurrent applications, VT100 emulation	\$2,310-\$6,490
The Info Group (508) 873-8363	ATMS voice/data network management system	Both	5 actual	Both	DEC VAX; IBM AT, PS/2 and compatibles; IBM CICS	Multisite voice/data networks	Yes	Yes	Yes	Simulation	None	Yes	No	Yes	Yes	Yes	Yes	Color graphics, windowing	\$25,000-\$200,000
Infotron Systems Corp. (609) 424-9400	Integrated Network Manager	Both	1,250 actual	Both	Proprietary	T1, T3, X.25, STDAM, TDM	Yes	Yes	Yes	None	Proprietary	Yes	Yes	Yes	Yes	Yes	No	Color graphics, windowing, zoom, maps, mouse, icons	\$35,000-\$82,000
	Advanced Network Manager	Software	160-960 actual	Own	IBM AT, PS/2 and compatibles	TDM, T1, switching, STDAM, Network Processor	Yes	Yes	Yes	None	Proprietary	Yes	Yes	Yes	Yes	Yes	No	Color graphics, windowing, zoom, maps, mouse, icons	\$14,000-\$16,500
	NV, NP, NX, INX	Both	160-1,860 actual	Both	IBM AT and compatibles	STDAM, Network Processors, TDM, T1, Matrix Switch	Yes	Yes	Yes	None	None	No	Yes	No	No	No	No	Color graphics, windowing, zoom, maps, mouse, icons	\$4,000-\$7,500
Integrated Telecom Corp. (214) 334-3340	IDMS	Both	5 actual, 20 announced	Both	IBM AT and compatibles, Apollo workstation	T1	Yes	Yes	Yes	None	Dbase III	Yes	Yes	No	Yes	Yes	No	Color graphics, windowing, zoom, mouse	\$15,000-\$40,000
International Data Sciences, Inc. (800) 437-3282	Sherlock	Both	1 announced	Own	IBM PC/XT/AT, PS/2 and compatibles	SNA, HDLC, Token-Ring, Ethernet, Baynet, X.25, DDCMP	Yes	Yes	Yes	No	None	Yes	Yes	Yes	Yes	Yes	No	Color graphics, mouse	\$450 per channel
Kinetica, a Division of Enclosia, Inc. (415) 947-0998	LAN Ranger	Software	None	SNMP standard (in future)	Pastpath 4 Gateway	Appletalk, Ethernet	Yes	Yes	Yes	None	None	Yes	Yes	Yes	No	No	No	Color graphics, windowing, zoom, mouse, printing, scrolling	Bundled with Pastpath 4, which sells for \$2,795
Legend Software, Inc. (201) 327-8771	LAN Patrol	Software	None	NA	IBM PC/XT/AT and compatibles	Ethernet, 10Base, Starlan, Novell Network, 3Com 3+Share, 3+Open, Vines, AT&T Stargroup	Yes	Yes	Yes	Modeling, simulation	Dbase III Plus, Dbase IV, any that supports ASCII files	Yes	Yes	Yes	No	Yes	Yes	NP	\$495 per LAN
Logant Corp. (800) 543-8880	Notary	Software	2 actual, 2 announced	Both	IBM 370 systems	SNA	Yes	Yes	Yes	Modeling with recommendation facility	None	Yes	Yes	Yes	No	No	Yes	Color graphics, menu	\$11,250

NETWORK MANAGEMENT TOOLS

PRODUCT SPOTLIGHT

COMPANY	PRODUCT	HARDWARE OR SOFTWARE	NUMBER OF LINKS WITH OTHER NETWORK MANAGEMENT SYSTEMS	PROPRIETARY OR NONPROPRIETARY LINKS	HARDWARE PLATFORM	TYPE OF NETWORKS MANAGED	ALARM MONITORING	TRAFFIC MONITORING	REALTIME NETWORK STATUS MONITORING	CAPACITY PLANNING CAPABILITIES	DBMS SUPPORTED	REMOTE FACILITY TESTING	LINK-LEVEL DISPLAY AND DIAGNOSTICS	RESOURCE UTILIZATION ANALYSIS	CONFIGURATION MANAGEMENT	SECURITY AND ACCESS CONTROL	CHARGEBACK AND BILLING	WORKSTATION FEATURES	PRICE
Mansueti Data Com, Inc. (804) 681-0000	Manager I	Both	1 actual	Own	Sun workstation	WAN	Yes	No	Yes	No	Proprietary	Yes	No	No	Yes	Yes	No	Color graphics, windowing, zoom, mouse	From \$35,000
	Manager II	Both	3 actual	Own	Sun workstation	WAN, modem, T1, stat mux, DSU, CSU, X.25	Yes	Yes	Yes	No	Proprietary	Yes	Yes	Yes	Yes	Yes	No	Color graphics, windowing, zoom, mouse	From \$99,000
	Integrator	Both	3 actual	Own	Sun workstation	WAN	Yes	Yes	Yes	No	Proprietary	Yes	Yes	Yes	Yes	Yes	Yes	Color graphics, windowing, zoom, mouse	From \$143,000
Micro Technology, Inc. (800) 999-9684	Manager	Both	NP	Own	Any 80286- or 80386-based PC running MS-DOS	Ethernet, DECnet, TCP/IP, Sun NFS, Novell, Apple, XNS	NP	Yes	Yes	Modeling, simulation	None	Yes	Yes	Yes	Yes	No	No	Color graphics, zoom	\$22,500-\$30,500
NEC America, Inc. (408) 433-1280	NCMG/PC 386	Both	None	NA	Proprietary	Point-to-point, multipoint and Tandem networks	Yes	No	Yes	None	Unify	Yes	Yes	Yes	Yes	Yes	No	Color graphics, windowing, help screens	\$16,000-\$37,500
Netline Communications Corp./Data Systems (415) 573-1300 (604) 430-6683 (Canada)	Advanced Network Management Architecture	Both	4 actual	Own	DEC VAX	Any voice or data network	Yes	No	Yes	None	Powerhouse	No	Yes	No	No	Yes	No	Graphics, windowing	\$100,000-\$300,000
Network Research Corp. (805) 485-2700	Fusion Network Software/Network Management	Software	NP	Other	DEC VAX/VMS, and any 80286- or 80386-based PC running MS-DOS or Xenix	TCP/IP, XNS	No	Yes	Yes	None	None	Yes	Yes	No	Yes	No	No	Text-based system	Included with Fusion TCP/IP on VAX systems, sold as option for PCs for \$50-\$75
Newbridge Networks, Inc. (703) 834-3600	4602 Main Street	Both	2 actual, 6 announced	Both	Sun workstation	DEC backbone with analog tail circuits	Yes	Yes	Yes	Network design and planning	Unify	Yes	Yes	Yes	Yes	Yes	Yes	Color graphics, windowing, zoom, mouse	Starts at \$30,000
Northern Telecom, Inc., Data Communications Systems Division (214) 301-2714	Meridian DNS	Both	1 actual, 7 announced	Both	Proprietary	Voice, SNA, TCP/IP, proprietary	Yes	Yes	Yes	None	Informix	Yes	Yes	Yes	Yes	Yes	Yes	Graphics, windowing, zoom, mouse	\$30,000-\$90,000 per node
Peregrine Systems, Inc. (714) 727-3341	Peregrine Network Management System 3	Software	1	Both	Any running MVS	Any voice or data network	No	No	No	Network performance analysis	Proprietary	No	No	No	Yes	Yes	No	Graphics, windowing, menuing	NP
Road-Millip (800) 327-4440	CMS Multi-Link 4	Software	4 actual, 6 announced	Own	IBM PS/2 and compatibles	X.25, T1, modem, matrix switch, dial-up, 3270 terminal	Yes	Yes	Yes	No	Oracle	Yes	Yes	Yes	Yes	Yes	No	Color graphics, windowing, mouse	\$3,100-\$19,463
Spider Systems, Inc. (617) 270-3516	Spidermonitor	Both	None	NA	IBM PC/XT/AT and compatibles	Ethernet, IEEE 802.3	In R&D	Yes	Yes	Measures impact of adding new applications	None	Yes	Yes	Yes	No	In R&D	No	Color graphics	\$7,850-\$11,900
Synoptics Communications, Inc. (800) 873-8923	Latimer Network Management	Both	None	NA	IBM AT and compatibles	Ethernet	Yes	NP	Yes	None	None	No	Yes	Yes	Yes	Yes	Yes	Graphics, windowing, mouse	NP
Telco Research Corp. (615) 329-0031	CCO System	Software	None	NA	IBM running MVS and CICS, DEC VAX	Voice and data	No	Yes	No	No	None	No	No	Yes	Yes	Yes	Yes	None	NP
	TRC System	Both	NP	Own	IBM PC/XT/AT, PS/2 and compatibles	Voice networks	No	Yes	Yes	No	None	No	No	Yes	Yes	Yes	Yes	None	NP
Telecast Communications Corp. (800) 633-3638	TP5000 Network Control Center	Both	3 actual, 6 announced	Both	Prime 50 series, IBM AT and compatibles	Hybrid and dedicated packet switching, T1	Yes	Yes	Yes	No	Rsupport, Oracle	Yes	Yes	Yes	Yes	Yes	Yes	Color graphics, windowing, zoom, mouse	NP
Telika, Inc. (312) 505-0099	Telemark	Both	1 actual, 1 announced	Both	DEC Microvax	Telco transmission networks, T1 multiplexer, hybrid networks	Yes	Yes	Yes	Modeling	Oracle	Yes	Yes	Yes	Yes	Yes	Yes	Color graphics, windowing, zoom, mouse	\$60,000-\$750,000
Telewatch, Inc. (800) 425-1386	Netcom 2000	Both	NP	Own	Sun workstation	Voice, data, fax, T1 networks	Yes	Yes	Yes	No	ingres	Yes	Yes	No	Yes	Yes	Yes	Color graphics, windowing, zoom, mouse	\$50,000 and up
Timeplex, Inc. (301) 933-4690	Time/View	Both	3 announced	Other	Sun workstation	T1, stat mux, packet switching networks	Yes	Yes	Yes	None	Informix	Yes	Yes	No	Yes	Yes	Yes	Color graphics, windowing, zoom, mouse	NP
TRW Information Networks (313) 273-0161	NM 200 2/4	Software	NP	NP	Sun workstation	TCP/IP, Ethernet 802.3	Yes	NP	Yes	NP	Informix	Yes	Yes	Yes	Yes	Yes	Yes	Color graphics, windowing, mouse	\$19,995 (including hardware)
Vanco Systems, Inc. (703) 471-9402	ATS 1000 Analysis & Test System	Both	1 actual, 4 announced	Own	Proprietary	IEEE 802.X LAN	Yes	Yes	Yes	No	None	Yes	No	Yes	Yes	Yes	No	Color graphics, windowing, zoom, mouse	\$23,000
Vir, Inc. (215) 364-8886	Smartpatch, Smart Switch Patch, Cable Man	Both	NP	Own	NP	Digital and analog	Yes	No	Yes	No	None	Yes	Yes	Yes	Yes	Yes	No	Color, windowing, mouse	From \$80 per part
Vitalink Communications Corp. (415) 794-1100	802 WANmanager	Both	2 actual, 3 announced	Own	DEC Vaxstation	WANs	Yes	Yes	Yes	No	Informix	Yes	Yes	No	Yes	Yes	No	Color graphics, windowing, mouse	\$30,000
Wang Laboratories, Inc. (800) 830-9364	Netview Gateway/OSI Management	Software	None	NA	Wang VS systems	IEEE 802.3, Bayport, X.25 WAN, Novell, 3Com, IBM Token-Ring PC LANs	Yes	Yes	Yes	NP	NP	Yes	Yes	Yes	Yes	Yes	No	Color	Up to \$5,300

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OS/2 NEWS

Volume 1, No. 3.

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IN DEPTH

Bridging the gap between Macs and PCs

Today's hybrid micro links can be powerful, flexible and inexpensive

BY JEFFREY N. FRITZ

Few would dispute that barriers to communication interfere with progress. Remember the story of the Tower of Babel? Yet just about every computer manufacturer — from mainframe to micro — has gone to great lengths to see that their computers speak their own unique languages.

Digital Equipment Corp. machines do not speak IBM's lingo and even IBM machines do not necessarily communicate well with other IBM computers. SDLC, HDLC and TCP/IP are just a couple of the many protocols in use today. Each protocol system is incompatible with the others.

Nowhere is the incompatibility problem more evident than in the not-so-cold war between Apple Computer, Inc.'s Macintosh and MS-DOS-based personal computers. Incompatibility problems have become so common that it is al-

most taken for granted that Apples and PCs simply do not mix. It may be OK to use both machines — just don't expect to share information between them.

Fortunately, this two-camp theory of personal computing is changing. Macintoshes and PCs are beginning to gain the ability to exchange data in some pretty exciting ways. Several factors are driving this change:

- Local-area networks are becoming more popular and frequently feature a mixture of MS-DOS and Macintosh computers on the same network.
- After five years of being considered simply a "cute" machine, one not for serious business users, the Macintosh has been accepted in many phases of the business world.
- Software has improved as the Mac's capabilities have been enhanced. Programs that were developed exclusively for the Mac — like Aldus Corp.'s Pagemaker and Microsoft Corp.'s Microsoft Word and Excel — now

have popular MS-DOS sister applications. Likewise, MS-DOS programs such as Wordperfect Corp.'s Wordperfect and Ashton-Tate Corp.'s Dbase have found their way into the Mac world.

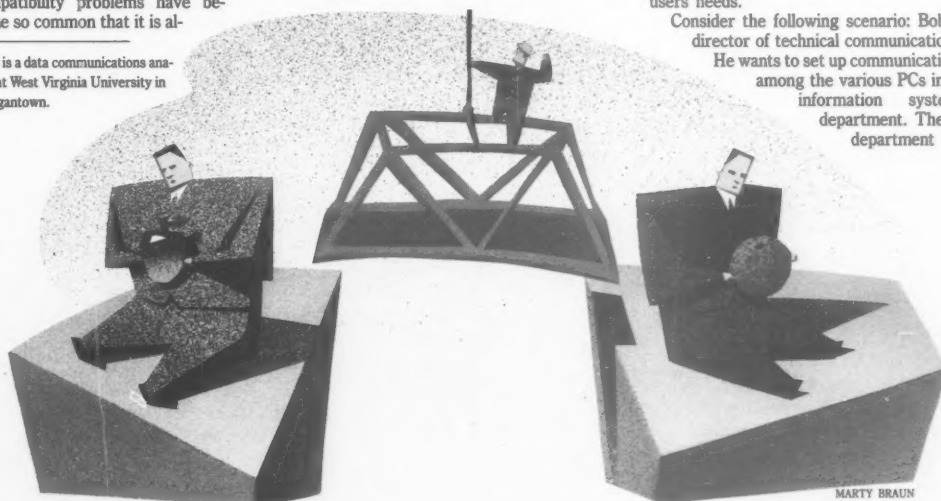
- Users have begun to notice that the ability to share files between programs running on a Mac and those on an MS-DOS machine increases their productivity and enhances their work.

Thus, Macintosh-PC communications has become a topic of special interest to many in the business world. Methods of developing the micro link range from using standard communications programs — inexpensive and cheap, but not very powerful — to building elaborate Ethernet bridges — powerful, but very expensive to implement unless the network is already in place. But there is a middle ground — one that is inexpensive and powerful, can be implemented in a variety of ways and is flexible enough to suit individual users' needs.

Consider the following scenario: Bob is director of technical communications.

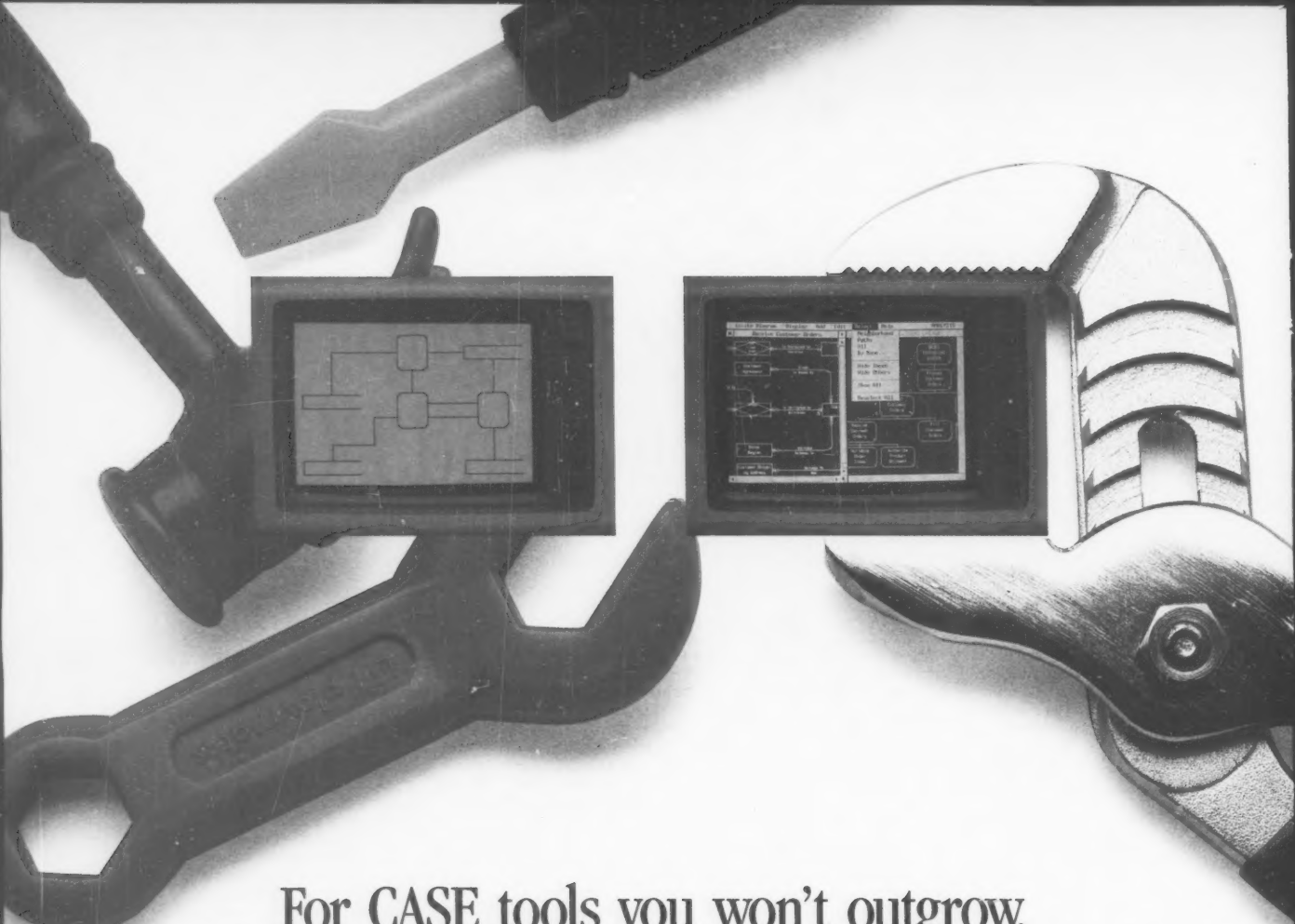
He wants to set up communications among the various PCs in an information systems department. The IS department is

Fritz is a data communications analyst at West Virginia University in Morgantown.



MARTY BRAUN

- Connections are not achieved by cable alone
- Of adaptors, translators and icon creators
- Transferring graphics remains tricky



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Real tools with the flexibility to fit your way of working

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preparing a presentation in hopes of gaining executive approval to build an expert system prototype. The department chief, Mr. Grant, has used Grandview, an electronic outliner by Symantec Corp. in Mountain View, Calif., to create the proposal's outline on a PC.

The problem is that Grandview does not run on a Mac and cannot handle the graphics Mr. Grant wants included in the presentation.

It would be nice if Bob could simply copy the Grandview file to a disk and pop the outline into Symantec's More II, a Mac outliner that can create the graphic presentation. The key to this exchange, Bob thinks, is the fact that Grandview can export and import files in More's format.

Although Bob is right, all this direct compatibility does not come without a price. Unless he happens to have a Macintosh IIX, which he does not, his Mac

cannot read the PC's MS-DOS disk.

THE FACT is that although the Mac and some MS-DOS machines use the same type of floppy disk, their formatting is totally different.

Even though Grandview saved the file in the More format on a Mac-like 3½-in. disk, most Macs will simply stare at the disk and say "This disk is unreadable. Do you want to initialize it?" If Bob selects anything other than "Eject" in the Mac dialog box, Mr. Grant's many hours of Grandview labor are doomed to format heaven.

The fact is that although the Mac and some MS-DOS machines use the same type of floppy disk, their formatting is totally different. Want further proof? Take a Mac disk and slip it into the 3½-in. drive of a PC. MS-DOS will have no idea what to do with it except — you guessed it — to format the disk in its own language, thus neatly erasing all the precious Mac files.

The missing link

What Bob needs is an inexpensive device to interconnect the Mac and the PC. Fortunately, such a device does exist. In fact, it is included on all Macs and most PCs. This device is the serial, or modem, port on the back of the machine.

By connecting the Mac and PC serial ports by direct cable, modem or other communications device, the machines can be made to speak a common language. The basis for this language is the Electronics Industry Association (EIA) standard RS-232C specification. It standardizes how data is sent and re-

ceived serially and what lines are used to accomplish the communications.

So the first step in Bob's communications plan is to obtain a cable to interconnect the Mac and the PC. But here he has to be a bit careful. Although the EIA standard describes the serial port, not all computer manufacturers have placed the same physical serial connectors on

their machines.

The Mac Plus, Mac SE and Mac II all take a male mini DIN-8 connector. IBM Personal Computer AT types of PCs as well as the IBM Personal System/2 series MS-DOS machines take a female DB-9 connector. The older PC XT's take a female DB-25 connector. Most modems take a male DB-25 connector. And just for good measure, the original

Mac and the Mac 512 take a male DB-9. Hopefully, only one or two types of machines are to be interconnected. Otherwise, Bob will have to carry around a small tool kit of cables and adapters for each computer.

Cable choices

Once Bob gets the connectors right, he must give some thought as to how the machines

will be interconnected. If he is using modems, then standard serial cable can be used.

However, if he wants to connect the serial port of one machine directly to the serial port of another, he needs to use a null module cable or null modem adapter to reverse some pin connections internally so that the machines can talk.

Of course, simply connecting



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the serial ports does not make for immediate communications. It is kind of like the first dance you went to in junior high school. The boys stood on one side of the room, the girls on the other. About the only ones who danced, it seemed, were the chaperones. What is needed is a catalyst to bring the two sides together. This catalyst will function as an electronic intermediary be-

tween the two machines.

There are many products that fit this category. Two such mediators are Laplink Mac from Traveling Software, Inc. in Bothell, Wash., and MacLink Plus from Dataviz, Inc. in Trumbull, Conn.

Both Laplink Mac and MacLink Plus use the same general concept. They work in conjunction with the serial ports to en-

hance the capability for file transfer between the Mac and the PC. Both include software to run on both sides of the transfer, and both include a null modem cable to connect the two machines. The cables were designed with several types of connectors included, so chances are Bob will be able to make the connection without running out to his local computer retail store

more than once or twice for adaptors.

Interestingly, however, both programs go about their task from two entirely different perspectives.

Laplink Mac

Laplink Mac is related to another program, Laplink Plus, also offered by Traveling Software. Laplink Plus is frequently used

to transfer files between laptop computers and desktop machines. However, the program also works well between desktop machines.

In line with its heritage, Laplink Mac is oriented toward the PC user and does all the work on the PC side. Sorry, no mice or icons allowed here. Instead, Laplink Mac shows a split screen. The left side lists the files on the PC's drive; the right side shows the Mac files. Laplink Mac allows the user to select drives on either machine directly from the PC program interface.

The program allows copying of single files or multiple-file groupings. Wild-card copying of files and renaming of individual files is included. Laplink Mac also allows the user to view the contents of a file even before the transfer is made. This is a very handy option, especially for text files. It allows double-checking to ensure that the proper version is selected before the transfer.

Because the Mac can handle 57.6K bit/sec. speeds from its serial port, file transfers can be done rather quickly over cables or high-speed data networks.

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Forget the 19.2K bit/sec. limit on the serial port — most modern machines can go a lot faster using their back ports provided the cable is not more than 50 ft long.

With the PC being the workhorse under Laplink Mac, the Mac becomes just a passive partner obligingly transferring files at the command of the PC. In fact, the only Laplink Mac menu choices that appear on the Mac are for setting the transfer rate and quitting the program.

This might seem somewhat offensive to Mac fans because the less friendly PC environment must be used to make everything happen.

However, this is also a hidden advantage — Laplink Mac uses a scant 70K bytes of precious Mac memory. That means that a 1M-byte Mac Plus running under Apple's Multifinder can transfer files in the background while another application is running in the foreground. It is a pleasure to have the ability to use Laplink Mac to transfer files while you complete that overdue report for your boss. Laplink Mac can busy itself with large or multiple file

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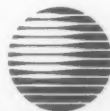
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transfers in the background without bothering the Mac's other work in any way.

MacLink Plus

MacLink Plus reverses the Laplink Mac scenario. It does its work on the Mac side, and the PC becomes the passive agent. Unlike the Mac, PCs running MS-DOS cannot currently do multitasking, so the PC cannot

EVEN IF AN intermediate language is found, some words will still be hard to translate. For example, except for the Southern dialect, English does not have a single word for the Hebrew equivalent of "you-all." The same situation exists in Mac and PC translations.

do anything except sit there and serve files. However, MacLink Plus comes with the familiar

Macintosh interface. You can use the mouse to control both the Mac and the PC. In fact, se-

lecting files on either side is much like working with the finder. Simply point and click.

MacLink Plus features can be adjusted to suit just about any preference. The settings permit use of direct cable connection if the two machines are close to each other. This allows for maximum speeds because direct cables are not as speed-restrictive as many other data transmission media. For further distances, MacLink Plus' modem options can be used. MacLink Plus has a setting for private branch exchange (PBX) telephone systems. This is handy in office situations in which a PBX also serves as a data switch.

Although it is flexible, a strange fact about MacLink Plus is that it overlooks an important transfer rate. Cable speeds can be set for many common higher transfer rates, including 9.6K and 19.2K bit/sec. But the settings jump right from 19.2K to 57.6K bit/sec., missing the common asynchronous speed of 38.4K bit/sec.

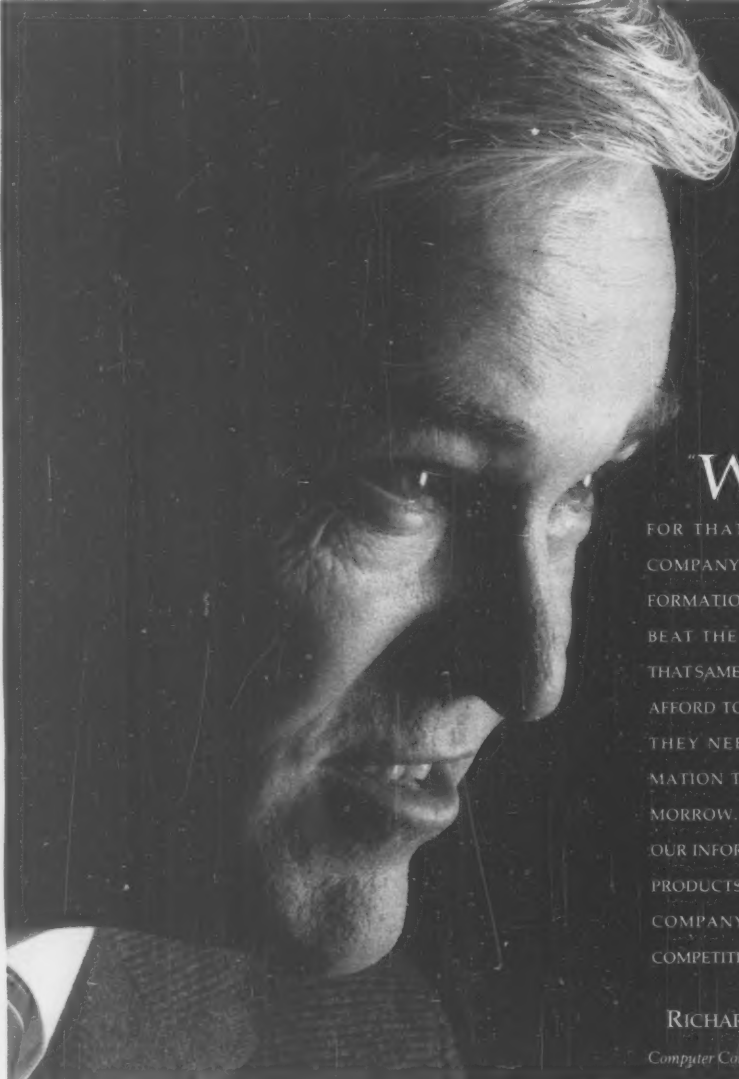
Formatting issues

Now, after purchasing his program of choice, Bob is nearly done. However, he has one other issue to consider — how to translate the many different file formats that exist between programs. Software vendors are notorious for creating programs that use different file formats entirely — witness Dbase III and Dbase IV. It is simply in the best interest of software producers to keep things a little stirred up. Indeed, a new file format may be developed that offers more powerful features than the older formats. Frankly, new formats also slow down clones because the programmers of the clone software are forced to analyze and learn a new file structure.

Unfortunately, Laplink Mac is limited in the translators it provides — it can only convert word processing files. The program on either end must be able to convert the files to and from the various formats. This is something of a disadvantage because many programs have very limited conversion abilities.

Laplink Mac can assign icon creators such as Macwrite, Microsoft Word or Excel to the document being transferred from the PC to the Mac. This means that the program's data icon will appear on the Mac side and can be double-clicked to simultaneously open the data file and launch the application on the Mac. Keep in mind that just because the icon creator is specified, the file itself has not necessarily been translated properly — or even at all. File structures and creator designations are two very different things.

In this regard, MacLink Plus comes with an important extra goody — it can translate between common Macintosh and MS-DOS file formats. This means that Wordperfect or Micropro International Corp.'s Wordstar files in their natural



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formats can be directly translated to Microsoft Word or Macwrite-type files on the Mac or vice versa. Translations are also available for Lotus Development Corp.'s 1-2-3, Excel and several other popular programs.

The translator will try to maintain special formatting including styles such as underlining and bold and italic typefaces and formats such as centering, margins and line spacing. Except for transferring graphics, which is a pretty tall order given the fact that many PC programs do not support graphics at all, the translator does a pretty good job of keeping data files intact.

If MacLink Plus does not support the particular file format you need, an intermediate program can be used as a bridge between formats. In a sense, an intermediate program is like two people who are bilingual but do not speak the same native tongue. As long as they both share a common language such as English, the communication problem is solved.

The same type of conversion can be done with the Mac and the PC. For example, a file can be saved on the PC and translated as a Macwrite file. Many Macintosh word processing programs can read Macwrite's format and translate the file to their own native format. The same is true on the PC side. Many PC spreadsheets and databases can import 1-2-3's file format.



But bear in mind that even if an intermediate language is found, some words or concepts will still be hard to translate. For example, except for the Southern dialect, English does not have a single word for the Hebrew equivalent of "you-all." The same situation exists in Mac and PC translations. Some features, such as special formatting that is not supported by the intermediate program, will be lost. However, most everything will get through, and what does not can often be added later with the target program.

Before you begin searching for translators, remember that some of the newer programs can read each other's files directly. If this is the case, a straight binary file transfer is quick, reliable and efficient. No extra translation is necessary.

As a last resort, ASCII or text

files can be used to translate between just about anything. When IBM came out with the PC, it decided to avoid the EBCDIC format used by its mainframes in favor of the more common ASCII format. The decision allowed the PC to speak a common language with other micros. So, in a sense, ASCII is the basic, most common, although the least robust, intermediate language. Special

formatting is not transferred with ASCII files that contain only readable characters. In other words, ASCII files contain no formatting information.

Grappling with graphics

Much progress has been made in Mac-to-PC communications, but there is still more to be done. Nowhere is this a bigger problem than in transferring graph-

ics. This is true even between the different programs running on the same Mac. Imagine what a job it is to translate graphics between the Mac and the PC when there is so little commonality within the same computer's graphics programs.

There are now some de facto standards emerging on both the Mac and PC side. Hopefully, 1989 will see a widespread adop-

tion of standard file formats. Until that happens, much can be accomplished with the tools at hand. There are new capabilities for communications between the Mac and PC leading to enhanced flexibility and power.

As Bob will find out, the ability to use the best machine and the best software for the most appropriate application can be a very liberating feeling. •

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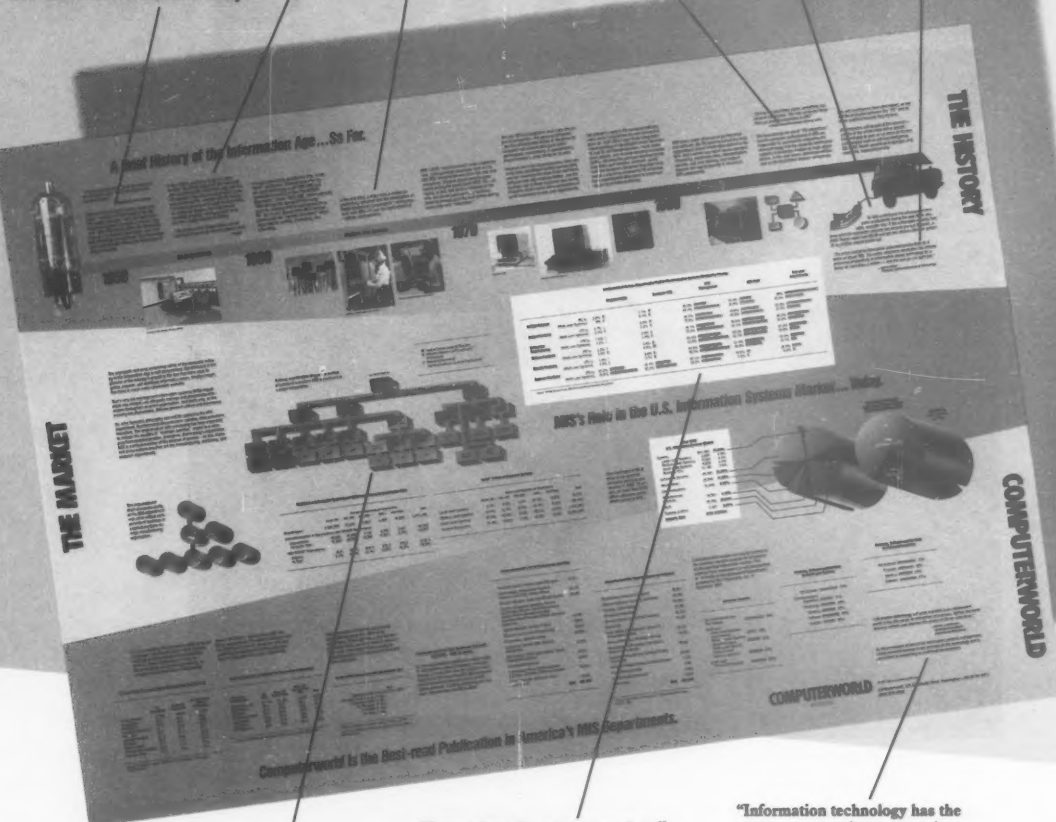
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To put everything in perspective, we have taken a brief look at where this young industry has been and how it is doing right now. It's all shown in the poster pictured here. Life size, it's 26" by 38", and it's full of interesting information on the new Information Age.



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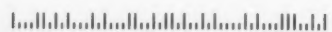
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INDUSTRY INSIGHT

Charles Varga

Blue whale raises ripples



In a little more than a decade, the tumultuous 20th century will be history. And whether or not you like it or believe it, few corporations have endured for the entire hundred years.

One of the exceptions is the computer industry leader. While most companies have been gobbled up in consolidations, mergers, holding companies and conglomerates for the sake of personal wealth, greed, growth, change or simply survival, IBM has prevailed as a sovereign corporate state.

Nor has IBM gained and maintained preeminence by swallowing its competitors. It is not and has not been an active acquirer, except in isolated instances. The principal reason? A very inquisitive U.S. Department of Justice, which made IBM more than just a bit jittery. The signing of a historic consent decree in 1956, lawsuits and the antitrust fever of the late 1960s and, finally, IBM's sale of The Service Bureau Co. to Control Data all seemed to crystallize and solidify IBM's image and position as a nonacquirer.

Further, it would be bad for
Continued on page 120

Siemens covets U.S. market

West German giant is revamping subsidiaries to appeal to U.S. customers

BY HELEN PIKE
CW STAFF

NEW YORK — Siemens AG, the West German electronics conglomerate, is on the outside of the American glass house looking for ways to get in.

To target computer and telecommunications sales in the U.S. more effectively, Siemens Corp., the firm's U.S. holding company, is rethinking the product lineup in its Information Systems Group.

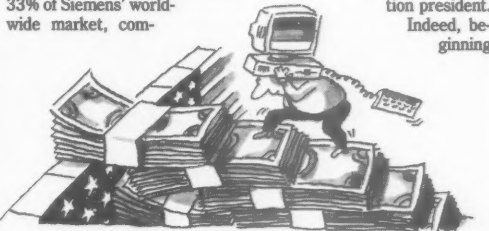
It is part of an ongoing corporate reorganization plan that began in October and calls for dividing its seven subsidiaries into at least 15 smaller, more reactive

business units (see story page 121).

The undertaking is an aggressive bid to make the U.S. the No. 1 market for the \$33 billion West German giant. The nation currently represents approximately 33% of Siemens' worldwide market, com-

pared with West Germany, which represents approximately half.

"Siemens is more than just computers and telecommunications," said Hans Decker, corporate president. Indeed, beginning



NICOLAE ASCIU

Vanderslice's regrets, hopes for Apollo's past and future

BY HELEN PIKE
CW STAFF

CHELMSFORD, Mass. — The pending sale of Apollo Computer, Inc. to Hewlett-Packard Co. presents a bittersweet segue for Apollo's chairman and president, Thomas A. Vanderslice.

On the one hand, there are hints of a fabulous golden parachute, shareholder insensitivity and market ignorance.

On the other is the

tip of a turnaround that signals the end of a nearly five-year struggle to keep Apollo afloat — the HP acquisition notwithstanding. Earnings for the first quarter ended April 1 were \$5.47 million on revenue of \$204.7 million. For the same quarter in 1988, Apollo earned \$1.3 million on revenue of \$168.9 million.

It is also the close of an era in which Apollo's technological achievements — network for large-scale



Apollo's Vanderslice

work-group computing, software graphics and parallel reduced instruction set computing under Unix — were overshadowed by a delayed move from a proprietary to an open platform, poor marketing and customer support, late deliveries and runaway costs in what was to become a highly competitive market.

"I regret I didn't get the word out better about Apollo," Vanderslice said after a brief, adjourned annual meeting last week. Later, using the company's Network Computing System as an example during a telephone interview, Vanderslice added, "It's another clear case of good technology but of a bad job of promoting it."

Under Vanderslice, large chunks of company money were

with semiconductors, Siemens' U.S. electronics offerings run the gamut from Integrated Services Digital Network chip sets to equipment for energy, automation, power engineering, graphics, lighting, printer and medical users.

In fact, its medical, energy and automation units do more than \$1.75 billion in combined annual sales.

However, while U.S. revenue reached approximately \$3.1 billion in the fiscal year that closed Sept. 30, Siemens posted an earnings loss of \$212 million. Most of the loss is attributed to ongoing investments such as the purchase of Allied Signal Corp.'s Bendix Automotive Electronics.

Undaunted and estimating that Siemens will post a loss this year, Decker said, "The investment for our future is not

Continued on page 121

poured into research and development: \$49 million in 1986, when revenue was \$391.6 million; \$67 million in 1987, when revenue was \$553.6 million; and \$84.6 million in 1988, when revenue was \$653 million.

As a further comparison, income earned during that respective three-year period was \$12 million, \$20 million and \$2 million.

R&D expenses

Apollo expects to spend between 10% and 12% of 1989 revenue on R&D. Of the company's 4,450 employees engaged in product development, 46% of those are engaged in hardware development and 54% in software development.

"Apollo's technology will
Continued on page 122

Quarterly earnings rattling along

BY NELL MARGOLIS
CW STAFF

Computer company earnings reports for the March quarter last week continued to draw the portrait of an increasingly competitive industry in which demanding and sophisticated users will not suffer outdated, belated or faulty products gladly and a good profit is hard to find.

Supercomputer pioneer Cray Research, Inc. cited shipping delays as largely underlying a net income drop of 94% from last year's first-quarter figure, shocking analysts and driving stock prices south. Despite revenue 20.4% below that in the last corresponding quarter and the admitted likelihood of more bad news in the second quarter,

President Marcelo Gumicio stated that Cray still expects a 10% revenue gain for the year.

Heavy demand from the military/aerospace sector and a quantum expansion in software offerings fueled minisupercomputer market leader Convex Computer Corp. to stunning strides in earnings and profits for the first quarter, company President Robert Paluck said.

The competition that is cramping the style of so many computer companies' sheets proved a boon to on-line transaction processing (OLTP) hardware player Stratus Computer, Inc., according to Chief Executive Officer William Foster. The OLTP market, he said, is booming because competitive pressure is driving corporations to

put mission-critical applications on-line.

Similar homage to competitive pressure came from Kenneth Pontikes, chairman of the board of Comdisco, Inc. With price/performance guidelines looming larger among computer buyers, Pontikes said, "the used computer market is experiencing its strongest demand ever." Comdisco reaped a 25% increase in profits on revenue that climbed 41%.

A barrage of well-received product entries kept the theme of "smaller is bigger" sounding for microcomputer giant Compaq Computer Corp., which not only harvested a 55% first-quarter revenue but saw an even stronger surge in profits, up 78% over first quarter last year.

1989 first-quarter earnings

Patterns — and profits — are hard to find as fortunes follow customer satisfaction

	Revenue January through March (in millions)	Percent change from 1988	Net income January through March (in millions)	Percent change from 1988
Alliant	\$15.7	(15%) ¹	\$0.1	(90%)
Altos	\$32.4	(24%)	(\$3.6)	—
Amdahl ²	\$470.3	20%	\$45.6	7%
Comdisco	\$437	41%	\$25	25%
Compaq	\$683	55%	\$83	78%
Convex	\$33.3	51%	\$3.6	249%
Cray Research	\$116.1	(20.4%)	\$1.5	(94%)
Excelan	\$20.9	58%	\$0.6	(52%)
Index Technology	\$8.1	27%	\$0.6	4%
Informix Software	\$31	20%	\$0.5	(81%)
MSA	\$63.2	2%	\$2.3	(4%)
Northern Telecom	\$1.4B	13%	\$47	(13%)
Stratus	\$76.2	41%	\$7.8	31%

¹ Parentheses indicate decrease or loss

² Income in previous year related to reflect stock split and acquisition

³ Revenue omitted to reflect consolidation of results of company's finance subsidiaries

CW CHART: FRANK C. O'CONNELL

Varga

CONTINUED FROM PAGE 119

its image for the industry leader to gobble up the little guys, since almost all the organizations that fit its strategic needs are so very much smaller. Thus IBM's approach has been to do arm's-length deals with preferred vendors — value-added resellers and value-added dealers — and to sign exclusive licenses with top software vendors in specific market niches such as health care, manufacturing and banking.

What has evolved is a highly competitive strategy of corporate alliances that paints IBM as a white hat rather than a black hat and indicates that the company

does not want to be a consolidator. Rather, it does want to spread money around to make the industry grow — for the benefit of itself and others — and make investments in preferred vendors and suppliers.

Weighing both sides

On the other hand, it would be only technically correct to count IBM out of the acquisition business. It appears that while the IBMs, AT&Ts and DEC's of the world are coming out in white hats because of their realization that they can't acquire the world — otherwise everyone will be looking at them with jaundiced eyes — they are forcing a domino/ripple effect. The little guys are looking for friendly mergers and strategic relationships to

fend off being attacked by the big whales, and the whales are still looking for easy guppies.

The theory behind the domino/ripple effect is that all acquirers must in their antitrust application to the Justice Department cite as a compelling reason that they have to compete with IBM and therefore must have critical mass and size. That's the bottom line.

Clearly, the 1988 alliance of DEC and Apple was forged to produce a Mac/VAX assault on traditional IBM territory. AT&T has recently generated its own flurry of announcements, including a venture with GTE, the purchase of Paradyne, the purchase of Harris' Pactnet satellite ground station technology and a strategic alliance with Cincom Systems

— all part of the domino/ripple effect and all affecting some part of IBM's competing products/services investment strategies.

So what of the future? Will the white hats continue to keep their hands — and purses — away from their smaller competitors? Or will we perhaps see a spate of new mega-mini mergers? One of the deals we may or may not see in our lifetime could be a merger of IBM and AT&T. Just think of it, a new symbol for the big board: BMBB, for Big Ma Blue Bell.

Varga, a 20-year computer industry veteran based in Frenchtown, N.J., is publisher of "The Cerberus Report," a study of industry mergers and acquisitions.

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IN BRIEF

Home run

Chelmsford, Mass.-based MRS Technology, Inc., whose lithography system for high-volume manufacturing of color active-matrix LCDs has scored in Japan but has not gotten to first base in the U.S., last week announced the first domestic sale of its flagship printer. The buyer: the David Sarnoff Research Center (DSRC), a leader in television and display technology. Both MRS and DSRC are activists in the effort to launch a U.S.-based high-definition television market.

Triple play

Rockville, Md.-based Sage Software scored a triple play last week, broadening its product line, boosting its customer base and adding a distribution channel by acquiring Beaverton, Ore.-based Polytron Corp. in a stock-for-stock exchange valued at approximately \$8.1 million. Polytron provides change-management software to users of IBM Personal Computers and local-area networks.

Strike 600

Aiming at improving its competitive stance, Intel Corp. last week announced an agenda of cost-cutting actions to be taken throughout 1989. Included on the list are the elimination of up to 600 positions — many of which are expected to result in redeployment rather than layoffs, according to Intel — and cutting back to a standard five-day work week at the company's Chandler, Ariz., wafer fabrication plant.

Batter up

Ron Posner, new chief executive officer of Santa Monica, Calif.-based personal computer utilities vendor Peter Norton Computing, Inc., last week announced that David Blumstein is the firm's new president. Blumstein, an independent management and marketing consultant to the PC industry, most recently served as vice-chairman of Ingram Micro D distributor.

Siemens' bid for market

BOCA RATON, Fla. — Later this year, Siemens AG will split up its Information Systems Group, creating at least two separate business units to accelerate its quest for a greater share of the U.S. data processing market.

One subsidiary will be dedicated to the sales, marketing and development of private communications systems and networks. The Rolm private branch exchanges, to be bought for \$1 billion from IBM, will be placed in this still-unnamed unit along with Siemens' central office switching systems, according to a Siemens spokeswoman.

To further its entry in the U.S. market, Siemens also will establish a subsidiary whose products are to include IBM-compatible personal computers capable of running Unix, terminals and peripherals such as the high-speed printers that have given Siemens a sizable installed base. These high-volume products can all be sold through the same distribution channels, a fact Siemens hopes to exploit.

Plans to bring to the U.S. its non-IBM-compatible, mainframe-based products now sold in Europe by the parent company are a long way off, according to Corporate President Hans Decker. However, Siemens' Unix commitment is not. Decker points out that the large-scale computers are Unix-based and, furthermore, Siemens is a member of the U.S.-based Open Software Foundation.

Other ventures expected to enhance Siemens' IS effort include:

- An anticipated joint marketing agreement with IBM for the Rolm private branch exchanges. The arrangement would strengthen Siemens' head-to-head competition against AT&T and Northern Telecom, Inc., said Gregory Francfort, a securities analyst at First Boston Corp. in New York. Siemens is also selling an increasing number of central switches to the former Bell operating companies, he added.
- A joint development and marketing agreement with U.S. semiconductor manufacturer Intel Corp. for mission-critical computer systems based on an Intel microprocessor and Siemens systems engineering. The company is called Biin Co. and is seeking its first customers in the air-traffic control sector.
- A similar joint venture with Corning Glassworks, Inc., for fiber-optic cables. The company is called Siecor and is based on Corning's glass technology and Siemens' cabling capability.
- Marketing agreements with Westinghouse Corp. concerning Siemens' Simatic programmable logic controllers and Westinghouse's molded case circuit breakers.

HELEN PIKE

Siemens

CONTINUED FROM PAGE 119

measured by quarterly results."

Nor does there appear to be any immediate need to use that type of measure with \$13 billion from West Germany to pour into acquisitions, joint marketing deals and internal projects such as telecommunications software.

Within reach

"An annual growth rate of 15% a year is doable," Decker added, referring to plans to transform U.S. earned income from red ink to black ink in approximately three years.

Siemens' fortitude could reach legend-

ary proportions. Gregory Francfort, a securities analyst at First Boston Corp. in New York, pointed out that the parent company went into the mainframe business in 1968 in Europe and ended up losing money until 1983.

"They have a very longtime planning horizon. They're like a Japanese company in that respect," Francfort emphasized.

But in the U.S. market, Siemens is reportedly in competition with a vari-

ety of domestic organizations.

When it comes to telecommunications, according to Francfort, the competitive process is one that could take quite a long time.

"It won't be in three years," he said. "Product development takes a lot."

Products are not the only challenge for Siemens, according to Angele Boyd, manager of print market planning services at International Data Corp., a market research organization based in Framingham, Mass.

"Siemens is a technology-driven company — but you need more," Boyd said. "Will they be clever in terms of marketing? The jury is still out."

"It's not easy to start from scratch," Decker said.



Siemens' Decker

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PILOT
EXECUTIVE SOFTWARE

DCA tells of blunders behind falling earnings

BY PATRICIA KEEFE
CW STAFF

ALPHARETTA, Ga. — By its own admission, Digital Communications Associates, Inc. (DCA) continues to be plagued by a series of missteps that most recently have contributed to a 42% decline in earnings for its third quarter ended March 31.

Officials of the IBM 3270 terminal emulation supplier spoke to analysts in a rare teleconference several weeks ago and uncharacteristically detailed a year's worth of mistakes, touching on plans to reverse the tide.

Analysts said DCA Chairman Bertil

Nordin bluntly described management as having been "asleep at the switch" and explained that the firm is getting squeezed between maturing technology and unshipped products.

"I think DCA really missed the boat, and it's not clear what their strategy is," said Mary McCaffery, an analyst at C. J. Lawrence in New York.

That information, coupled with disappointing third-quarter earnings, has led many analysts to predict flat growth for at least the next year and possibly through 1991. "The question is, are they digging themselves deeper or are they climbing out?" said Richard Kimball, an analyst at

Montgomery Securities in San Francisco.

A rescheduled analysts' meeting was slated to take place last Wednesday, a week after the release of the DCA/Microsoft Corp. Communications Server, which links OS/2 users to IBM Systems Network Architecture hosts.

Nordin said endless rumors of a buyout have slowed bookings. He predicted it will be 12 to 18 months before a turnaround can be expected, reported Harry K. Rosenthal, an analyst at Deutsche Bank Group in New York.

DCA's bottom line has been skewed by a number of factors: late product shipments, sluggish acquisitions, weak distri-

bution and increased and aggressive competition, which together have unseated DCA as the 3270 kingpin.

Problem areas include the following:

- **Irma 3270 line.** The high-margin products make up about 60% of DCA's revenue stream, analysts said. However, the maturing technology can no longer carry the company, according to Rosenthal. Nordin told analysts that DCA will unbundle Irma to counter users who opt to buy cheaper hardware.

- **Sales performance.** DCA was slow to react to heavy discounting, Nordin admitted. Also, DCA's T1 sales team shrunk from a force of 50 a year ago to just 30 today, which forces DCA to rely too heavily on OEMs to move its products, McCaffery said. "They didn't sell any T1 products last quarter."

- **Unsuccessful diversification.** 10Net's inability to compete with local-area network market leaders for corporate accounts has forced DCA to push the division toward government sales. The Network Communications Division has also failed to meet expectations, particularly since DCA expects losses incurred by its Digital Transmission Systems, Inc. acquisition to continue the next few quarters.

- **Wide-area networks.** T1 competitors, notably Network Equipment Technologies, Inc. (NET) and Newbridge Networks, Inc., have stalled DCA's entry into the T1 market with aggressive pricing.

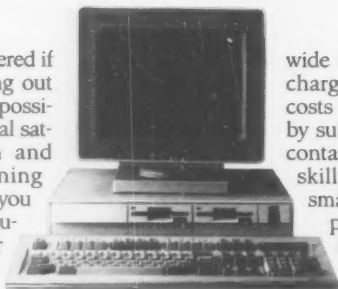
While DCA has admittedly stubbed its toe on product enhancement and upgrade delays, Nordin claimed NET launched a program four months ago designed to gain as many contract awards as possible at DCA's expense. DCA's 25% discount policy was severely undercut by NET's offer of up to 40% off list, according to one analyst.

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Vanderslice

CONTINUED FROM PAGE 119

clearly remain," Vanderslice said, adding that there would be transition projects for the merged companies and joint development teams to be established.

The 57-year-old chairman and chief executive officer, who has had top-level tenure at GTE Corp. and General Electric Co., has not decided where he will go after the merger.

While Vanderslice declined to identify the members of the transition team, Bill G. Kay, general manager of HP's workstation business, now headquartered in Sunnyvale, Calif., reportedly was in Chelmsford last week to get the transition under way. HP has identified Kay as the executive who made the first contact with Apollo in late January.

"Consolidation is healthy for the computer industry," Vanderslice said, referring to a countertrend to combine mini-computer and workstation technology to offset the growing mainframe movement to distributed computing.

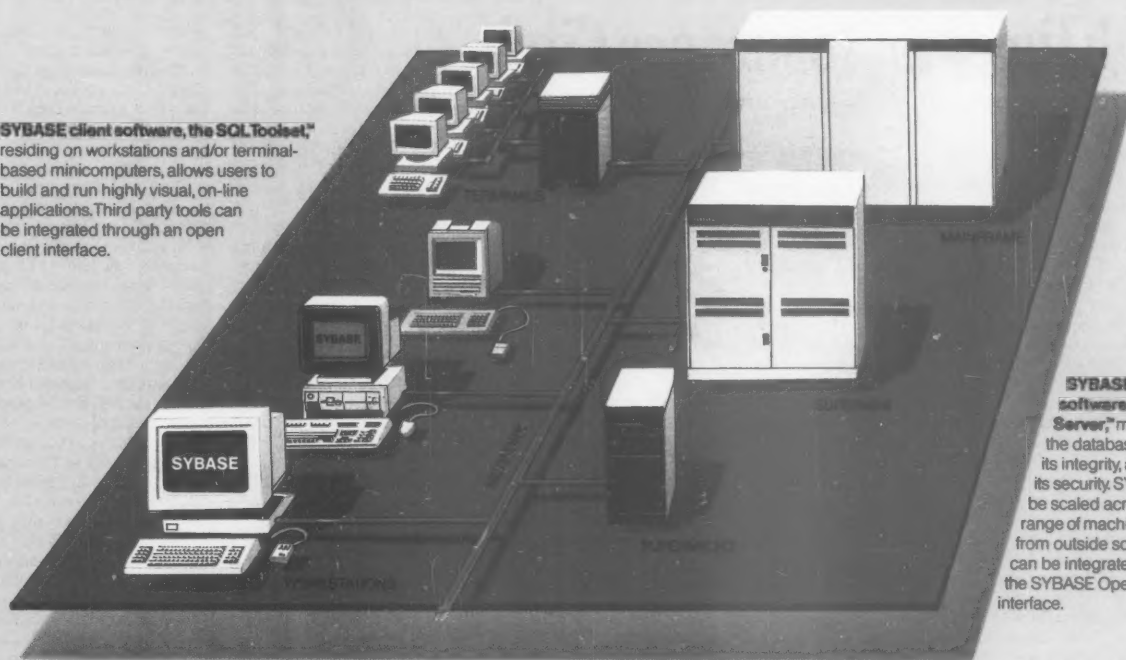
"It's hard for a billion-dollar company to have an impact these days," he said. "You have to have the size of an IBM or a DEC to make it. HP would have had a hard time without Apollo."

"I'm very pleased we managed to sell to a U.S. company," he continued. "We haven't encouraged anyone with just cash to come around." Moreover, he added, "I didn't just fire 20% of the people and get financial results for the company."

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COMPUTER CAREERS

Tough times in 'Insurance City'

Mergers and cutbacks are past, but the landscape has changed

BY JANET RUHL
SPECIAL TO CW



The insurance industry is emerging from a period of downsizing and mergers that has shifted the career prospects of MIS professionals. Companies are hiring but doing so more selectively than several years ago. As a result, MIS professionals with marginal skills may find the job hunt tough going in the insurance field.

The situation is particularly evident in "Insurance City"—Hartford, Conn., the home of many of the largest U.S. insurers. There, the period from 1984 to 1987 was a boom time for MIS. Ray Turner, manager of recruiting firm Source EDP's East Hartford, Conn., office, says that during this time, insurance companies saw requests for MIS support emanating from all departments.

The companies were committed to being first to use promising new technologies and were in the habit of rewriting systems every five years.

With the liability insurance crisis and other setbacks, the boom ended in 1987. In the wake of sagging profitability in the industry, Cigna Corp., Hartford In-

surance Group, Connecticut Mutual Life Insurance Co. and The Travelers Corp. all commissioned management consultant McKinsey & Co. to study their operations and recommend ways to cut expenses and improve operations.

Among the casualties was MIS. At each of these companies, there was layoffs, job cutbacks or reorganizations that affected significant numbers of MIS staffers. Further, MIS jobs were lost from merging data processing shops acquired in takeovers and spinning off unprofitable divisions.

Though the insurance companies will not divulge specific figures for MIS cuts, one recruiter says that of the 400 jobs cut at Hartford Insurance, 120 involved MIS. The ax also fell at The Travelers and Cigna. Connecticut Mutual and Phoenix Mutual Life Insurance Co., while not reporting layoffs, said they would cut staff through attrition.

Dramatic effect

The effect of these layoffs on the Hartford job market has been dramatic. Mark Jacobs, a recruiter at Data Pros in East Hartford, reports that it has become almost impossible to place batch Cobol programmers.

"The average maintenance programmer is going to have

some serious problems," Turner says. He says he sees many such people who have not found new jobs after six months of hunting. Many of them, he adds, have been slow to realize that it is no longer true that "because you are a programmer, you are worth zillions."

The recruiters agree that the layoffs hit two groups particularly hard: MIS middle managers and programmers brought in at the height of the earlier boom whose technical skills were marginal.

The climate has changed at the insurance firms, too, according to Jacobs. Many would-be job hunters have told him that the attitude in their firms now is that "You are lucky to still have a job." Raises have been infrequent and low, averaging around 3%. Many report that they have had to wait 15 to 18 months for a salary review.

The insurers have not stopped hiring but have upped their requirements. Turner says companies now require four to seven years of experience rather than three to five years with the aim of lightening the training load.

The people being hired today must also have additional skills. A recruiter in Cigna's Bloomfield, Conn., office says his company is eager to hire program-

mers with IBM DB2 and CICS experience, even for openings on batch Cobol systems that may not use those technologies. The reason? Cigna intends to rewrite its older systems to use the newer software platforms in the next few years and wants new hires to be ready to make a contribution to the effort.

Jane Hunt, a recruiter at Aetna Life and Casualty, which has avoided layoffs or cutbacks, says the company is actively recruit-

ing voice communications, DB2 database administration and fourth-generation languages including Information Builders, Inc.'s Focus, Oracle Corp.'s Oracle and Relational Technology, Inc.'s Ingres.

Alice Simon, a spokeswoman at The Travelers, says that even though her company laid off or reassigned a significant number of MIS staffers last year, it is still recruiting new hires to fill positions left vacant through attrition. Her company is looking for people skilled in Cobol, Unix and C. A spokesman for Cigna points out that it has been more than a year since his company's layoffs and that the firm is actively seeking qualified applicants.

The cutbacks in Connecticut did not go unnoticed by insurers in other parts of the nation. Several, including Executive Life Insurance Co., Safeco Corp. and Pennsylvania Blue Shield, saw Hartford's loss as an opportunity to pick up experienced insurance programmers.

But the projected bonanza did not materialize. Executive Life's John McFarland reports that the response to his company's recruiting efforts in Hartford was disappointing. He suggests that laid off programmers prefer to stay in the region and migrate into other industries rather than look for insurance positions elsewhere.

Ruhl is a consultant programmer in Windsor, Conn., and author of *The Programmer's Survival Guide: Career Strategies for Computer Professionals*.

COMPANIES now require four to seven years of experience rather than three to five years with the aim of lightening the training load.

RAY TURNER
SOURCE EDP

ing. It is moving away from a focus on technical expertise alone and is looking for people who can apply technical skills to the needs of the business, Hunt says.

Jacobs has seen companies willing to pay a premium for business-oriented expertise. He cites recent placements of people with experience in actuarial systems. But he reports an equally strong demand for experienced people with purely technical expertise, particularly MVS systems programming,

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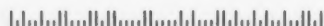


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The Jackson Laboratory

SYSTEMS PROGRAMMER

THE JACKSON LABORATORY is a Mammalian Genetics/Biomedical Research institution located adjacent to Acadia National Park in Bar Harbor, Maine.

● There is a full-time opening in our Computing Service as a Systems Programmer. Duties include maintenance of several UNIX-based minicomputer systems and VAX/VMS systems; installation, documentation, enhancement, design, implementation and support for hardware and software resources. Additional responsibilities include design, development and maintenance of our network including TCP/IP, Ethernet joining several LANs including LocalTalk and Token-Ring.

BS in Computer Sciences and a minimum of 4 years' experience maintaining UNIX and VMS systems and networks is required. Experience in Macintosh and MS DOS networking strongly preferred.

Qualified candidates interested in joining our team of computer professionals dedicated to the development, integration and support of a growing heterogeneous computer environment should contact:



The Jackson Laboratory

Attn: Harold R. Wheeler
Employment Manager
600 Main Street
Bar Harbor, ME 04609
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Kellogg's MANAGER, METHODOLOGY AND DOCUMENTATION

Kellogg Company, a world leader in quality food manufacturing, has a current opening in its Corporate Information Technology Department for Manager, Methodology and Documentation.

The Corporate Information Technology Department researches, develops, and maintains software in the following multi-vendor environment:

UNISYS (2200/812, 1100/93)
VAX (8810, 8700, 8650, 83XX)

The Manager, Methodology and Documentation will develop, implement, control, and maintain automated and manual documentation systems and procedures. This position will also coordinate and administer project management control to ensure compliance with established departmental methods and procedures.

This position requires an individual with formal training, including a bachelor's degree and a minimum of three years related experience or a strong background in a computer systems-related discipline. Incumbent should have significant experience with and knowledge of documentation procedures and techniques, as well as possessing some proficiency in the implementation of computerized support packages.

This highly visible, challenging position, located in Battle Creek, Michigan, offers growth based on performance, a competitive salary, Company-paid benefits and relocation assistance.

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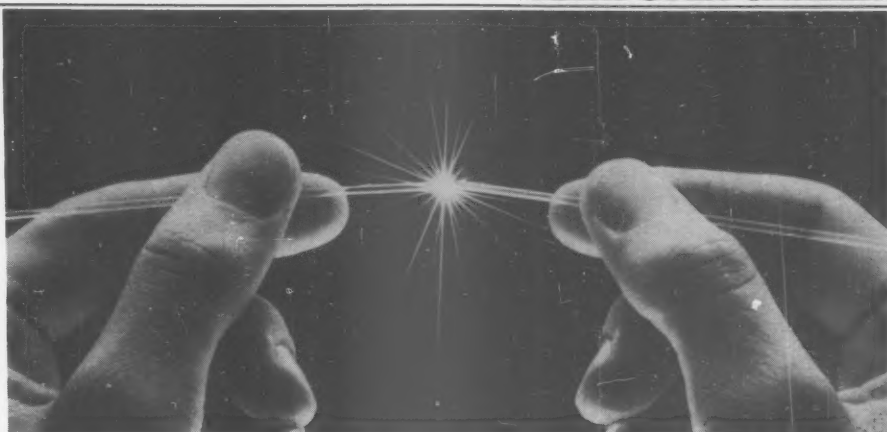
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Work with the company on the leading edge of telecommunications technology.

US Sprint has built the first and only nationwide Signalling System #7 based fully digital fiber communications network. This network is positioned for entry into the world of ISDN and Intelligent Networks. It is because of these kinds of technical challenges that we are expanding our Systems Development Organization. We are looking for individuals with energy, talent, and a commitment to be the best at providing advanced features and services to the emerging sophisticated customer base of US Sprint.

We are located in Kansas City, one of the cities that is expected to lead the nation's economic growth over the next decade. The 1.4 million people in Kansas City enjoy a cost of living that is significantly lower than the East and West coasts. Whether you're looking for big city amenities or small town convenience, Kansas City will welcome you and your family with its high standard of living and Midwest friendliness coupled with affordable housing, a thriving arts community, major league sports and one of the country's best educational systems.

Right now we are looking for several telecommunications and systems development professionals who want to share their skills and expertise with a young, vibrant industry leader—US SPRINT.

Technical expertise in the following areas is required:

- Software Development
- System and Network Architectures
- Data Communications and Protocols

Experience in one or more of the following areas is desirable:

- Intelligent Networks
- ISDN
- Network Management and Control Systems
- Signalling System #7
- Operations Support Systems
- Digital Transmission Control Systems

System Development

Your major responsibilities will be to plan and develop system architectures and detailed system requirements which will direct development and implementation of new telecommunications features and services. You will be designing and developing interfaces to switching systems, network support systems and IM systems for the purpose of data base downloading/uploading, billing and traffic data collection and surveillance. You will review and approve internal as well as vendor software and system designs to ensure that they meet stated requirements; negotiate modifications in vendor design; and manage vendor interfaces, including requests for information/proposal, vendor selection and vendor performance.

Openings exist at the following levels:

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Technical lead for Applications development organization. MSEE or MSCS required; 10-15 years in telephone software development. Extensive experience in hardware and software systems design for large scale applications of real-time transaction processing systems. Familiarity with industry standards should include work of ITIM and/or TISI standards committees. Excellent communications skills required.

Senior Engineer

BSEE or BSCS required, MS preferred; 5-10 years experience; emphasis on applications development in telephony environment. Experience with multiple software development methodologies and version control is essential. Development experience should include analysis, design, programming, testing and implementation of systems using a structured methodology on large scale applications.

Software Development

Your responsibility will be to develop software based applications running on DEC/VAX or TANDEM computers to provide operational support and customer features for the US Sprint network. Development will be oriented towards real-time transaction processing, data communications and database management systems.

TANDEM Software Development

Requires significant familiarity with data communications (SS#7, X.25, LU6.2, SNA, BISYNC and ASYNC). Technical skills include TANDEM SCOBOL, COBOL, SQL and TAL. Extensive knowledge of TANDEM Software is desirable, especially GUARDIAN Operating System, EXPAND, EXCHANGE, and PATHWAY Environment. Knowledge of "C" language desirable.

DEC/VAX Software Development

Requires significant familiarity with DECnet, LAT, VAX PSI, as well as previous experience in architectural development and programming of systems using relational/4GL database software, such as Ingres, Cognos, and VAX Rdb. Knowledge in high-level languages is a must and experience in Pascal or "C" is required. You must also have performed a development role using DEC VAX systems architecture and VMS operating systems.

Openings exist at the following levels:

Senior Engineer

BSEE or BSCS required, MS preferred; 5-10 years experience; emphasis on applications development in TANDEM or DEC/VAX environment. Experience with multiple software development methodologies and version control is essential. Development experience should include analysis, design, programming, testing and implementation of systems using a structured methodology on large scale applications.

Development Engineer

BSEE or BSCS plus 3-5 years experience with emphasis on software maintenance and applications development in TANDEM or DEC/VAX environment. Familiarity with multiple methodologies and version control helpful.

You will receive an outstanding salary and benefits package as well as the growth and potential that comes from US Sprint emerging as a major force in the telecommunications field. We reward action, innovation and risk taking. Our commitment to tomorrow's technology ensures that you'll get the opportunity to change the industry by developing the most advanced systems in the business.

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CONTINUUM DATA PROCESSING CAREER OPPORTUNITIES

The Continuum Company is the recognized international leader providing leading edge computer software and services for the life insurance industry. Due to considerable success in the international and domestic marketplace, The Continuum Company is enjoying substantial growth and has excellent career opportunities available if you have experience in one of the following disciplines. All positions listed require a four year college degree.

SENIOR PROGRAMMER ANALYST/ PROGRAMMER ANALYST

Minimum 3 years current experience in a IBM environment with structured COBOL, VM/CMS, IMS/DB, DB2 would be a plus.

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Minimum 3 years life insurance data processing experience with Universal Life and Variable Universal Life product knowledge, strong communication skills and some travel required Domestic and International.

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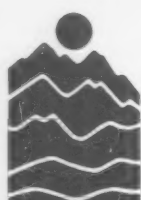
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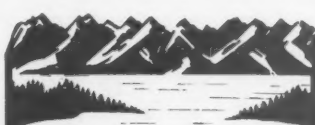
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MARKETPLACE

Shareware: An alternative tool

Programs reflect a marketing strategy, not just minimal capabilities

BY JANET RUHL
SPECIAL TO CW

It is a mistake to think of all shareware as unsuitable for the serious business computer user.

The term "shareware" describes a diverse collection of personal computer programs that range from one-file utilities to complete packages filling several disks. What they have in common is a unique approach to marketing. Shareware authors let the customer take a try-before-you-buy approach: Users may copy and try out the programs without charge.

Shareware, which is copyrighted, should not be confused with unsupported public-domain software and unsophisticated hobbyist utilities. In recent years, many serious business-oriented products have entered the marketplace and built up respectable user bases using a shareware marketing strategy.

Successful shareware products with enough registered users to support the development of subsequent releases are remarkably free of bugs. This may be because the only way developers can build a base of users willing to register a shareware program is by starting out with an outstanding program. In addition,

these products often come with ongoing product support that many people find to be as good as or better than what is provided by vendors that use more conventional marketing strategies.

Give it a try

Unlike commercial software, users can give friends or business associates copies of shareware programs to try or they can post the products on bulletin boards. However, they cannot sell copies commercially for more than a modest distribution fee. Third-party distributors — many of whom advertise in the PC trade press — can distribute the programs as long as they do not charge more than a modest fee, generally \$10 for each disk. Vendor compliance is informally monitored by shareware authors and more formally by the Association of Shareware Professionals, a trade group of developers.

Once users have tried out a shareware package and decide to use it beyond the trial period, they are expected to pay the developer a registration fee that is, in effect, the purchase price of the software. Registration, which varies widely in price but typically costs less than \$100, entitles the user to a range of

benefits such as telephone support, a manual, product upgrades and sometimes access to additional program features.

Among the more successful business-oriented products distributed as shareware are the communications package Procomm; the DOS menu system

There are also many shareware products for generic business functions such as general ledger, accounting, inventory tracking, project management and mailing list management as well as products for business graphics and computer-based slide presentations.

Shareware programs may be a good choice for novice users because of their ease of use. Shareware software is distributed on disks or in archived files stored in on-line libraries. Docu-

ate and distribute shareware. The Public Software Library (PSL), a Houston-based organization run by shareware aficionado Nelson Ford, only distributes programs it has tested and evaluated. PSL tracks bug reports and keeps abreast of developments affecting its offerings. In addition, Ford and other PSL staffers are experienced PC programmers and take care to check any new programs for viruses.

Another excellent place to locate the better shareware products is local and regional PC user groups. These groups, besides distributing shareware disks at a nominal cost, usually maintain files containing descriptions of the programs and review shareware releases regularly in their newsletters.

Ruhl is a consultant programmer in Windsor, Conn., and author of *The Programmer's Survival Guide: Career Strategies for Computer Professionals*.

IN RECENT YEARS, many serious business-oriented products have entered the marketplace and built up respectable user bases using a shareware marketing strategy.

Automenu; the database PC-File Plus; the word processor PC-Write; spreadsheets PC-Calc Plus, Instacalc and three-dimensional Qubecal; desktop manager Homebase; and Tapcis, a program intended to make it simple and inexpensive to use CompuServe forums and electronic mail.

While these packages are the superstars of the shareware world, software buyers can find a wealth of other, more specialized programs for applications as diverse as job costing, fleet maintenance, rental unit management and retail apparel merchandising.

mentation is in the form of files, so the products that have held their own in the marketplace have had to be easy to learn.

On-line support is also available for shareware products. The Association of Shareware Professionals meets regularly on CompuServe, and many shareware authors can be reached on CompuServe via electronic mail. In addition, technically knowledgeable members of CompuServe's IBM software forums often resolve user questions about shareware packages.

Shareware's popularity has led to the emergence of organizations that professionally evalu-

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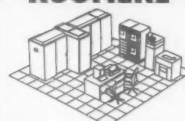
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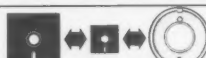
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TRAINING

Limbering up curricula

Conversions and relational technology call for more flexible courses

BY JONATHAN SAYLES
SPECIAL TO CW

Lou Holtz, head football coach at Notre Dame University, is credited with the observation, "We ain't where we oughta be, and we ain't where we should be, and we ain't where we're gonna be, and we ain't where we want to be. But thank goodness we ain't where we used to be!"

All data processing training organizations aren't so fortunate. I can think of at least two areas where we're still where we used to be, not where we ought to be.

One area is training for technology transitions. Consider what happens when longtime aficionados of one manufacturer's computer hardware convert to another company's equipment. All of a sudden it's off to school for dozens, perhaps hundreds, of the user's most expensive personnel.

And what do these expensive, veteran workers get in the classes? The basics. They study print commands, file concepts, basic application program develop-

ment, how to use a full-screen editor—all of it taught as if the students had never used a computer in their lives. There is no effort to leverage the five to 10 years of training in which the employees and their employer have invested.

New perspectives

If you're moving to a new technology, training should present that technology from specific perspectives. What is done the same as with the previous technology? What is done differently? What aspects of the old technology aren't retained at all? What is brand new? You should offer classes that compare and contrast the new and old technologies, not rehearsed entry-level courses.

Suppose, for example, you are converting from IBM machines to ones from Digital Equipment Corp. and training your IBM professionals to develop systems in the DEC VAX/VMS environment. You should offer classes that focus on the aspects of IBM's TSO and JCL that correspond with DEC's

Digital Control Language (DCL)—there are plenty of them. Then teach the DCL commands that are intrinsic to the VAX/VMS operating system.

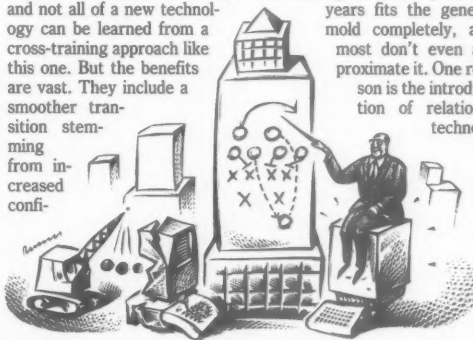
Delivering conversion training in this manner is not easy, and not all of a new technology can be learned from a cross-training approach like this one. But the benefits are vast. They include a smoother transition stemming from increased confidence, clearer perspectives,

deeper insights and greater involvement and enthusiasm.

There is another area in which a lack of flexibility in vendors' courses can create problems. While most courses are

high in quality, and you may locate a customized workshop or two, it is difficult for most vendors to make substantial departures from their standard curricula.

This situation would be all right if your organization fit the standard curriculum in terms of staff members' prior training, skills and responsibilities. However, almost no firm I've provided training for in the past few years fits the generic mold completely, and most don't even approximate it. One reason is the introduction of relational technology.



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ogy and the consequential blurring of traditional roles and lines of responsibilities.

Today, workers wear several hats. For example, applications personnel and end users help with database design, database

programmers write third-generation language programs to serve as database I/O modules, and systems programmers debug application program logic errors.

If you bring in off-the-shelf vendor courses, two problems tend to surface rather quickly: There is considerable overlap in content, and there are topics that are of no interest to a good percentage of the participants. You should therefore consider an alternative approach—implementing a modular curriculum organized around major topics instead of traditional job specifications.

To do so, you must do two things. One is to seek out the training firms that will customize for you. Second, before doing so, you must clearly identify what you need by studying the new technologies and the needs of line personnel.

In other words, conduct a needs analysis framed in your installation's requirements. Several insurance organizations such as Aetna Life and Casualty, The Travelers Corp. and Hartford Insurance Group have done thorough work along these lines.

Sayles is director of educational services at The Systems Group, Inc. in Glensbury, Conn.

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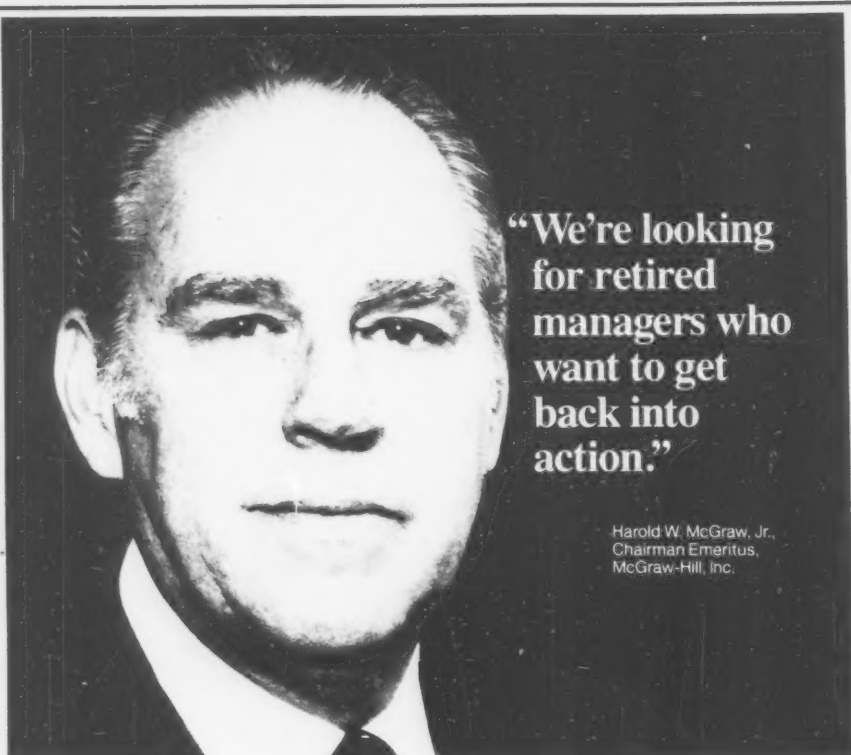
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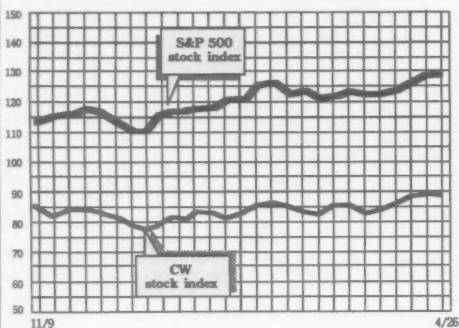
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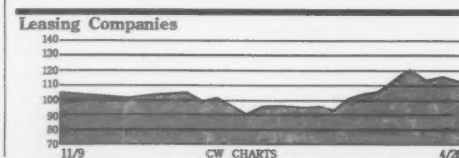
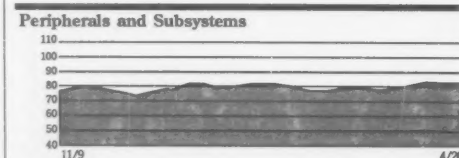
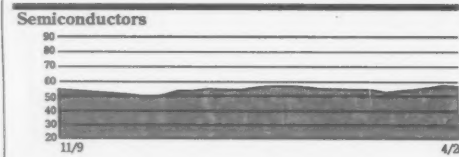
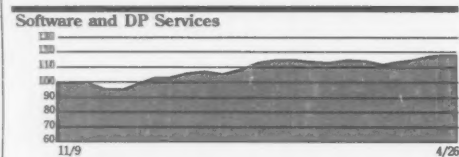
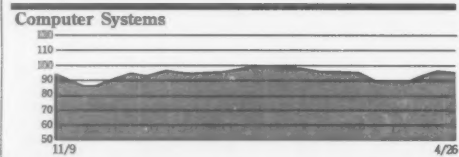
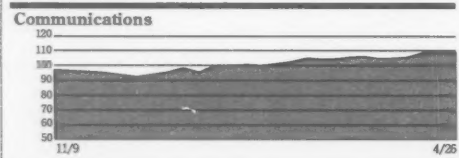
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May 15		Manufacturing Technology
May 22	Restructuring MIS — Distributing Resources	
May 29		Printers & Plotters
June 5	Special Feature: Systems Integration Executive Report: Workgroup Computing	
June 12	Technology Issues in Downsizing	
June 19		Micro DBMS

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Indexes	Last Week	This Week
Communications	109.1	109.2
Computer Systems	95.6	95.2
Software & DP Services	119.6	119.5
Semiconductors	58.3	57.5
Peripherals & Subsystems	81.1	81.0
Leasing Companies	116.3	111.5
Composite Index	89.8	88.9
S&P 500 Index	129.0	129.3



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52-WEEK RANGE	CLOSE APRIL 26, 1989	WEEK NET CHANGE	WEEK PCT CHANGE
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Communications and Network Services

American Info Techs Corp	57	43	56	2.1	3.8
Andrew Corp	22	14	20.5	1.3	9.3
ArTel Comm Corp	5	1	3.625	-0.6	-13.4
AT&T	35	24	34.375	0.9	2.6
Avant Garde Comp Inc	3	0	0.425	0.0	3.9
Avantec Inc	3	4	5.25	0.0	0.0
Aydin Corp	16	13	14.875	-0.1	-0.8
Bell Atlantic Corp	81	85	81	1.8	2.2
Bellsouth Corp	45	38	44.875	2.0	4.7
Compression Labs Inc	5	3	5.375	0.4	7.5
Computers Network Tech	5	1	1.407	-0.1	-6.6
Contel Corp	57	31	52.875	-2.0	-3.6
Data Switch Corp	9	4	4.5	-0.5	-10.0
Digital Comm Assoc	38	17	23.75	-0.1	-0.6
Dynatech Corp	23	17	17.5	0.0	0.0
Fibronics International	5	3	4.25	-0.5	-10.5
Gandalf Technologies	8	4	4.875	0.4	8.3
General Datacomm Inds	6	3	5.375	-0.3	-4.4
GTE Corp	48	34	47	-0.3	-0.5
Infotronics Corp	14	10	9.75	0.3	2.6
ITT Corp	59	45	57.375	-0.3	-0.4
MA Comm Inc	11	8	1.875	0.1	1.6
MCI Communications Corp	34	13	32.375	-0.8	-2.3
Network Equipment Tech Inc	25	14	22.25	-0.3	-1.1
Network Systems Corp	12	8	9.125	0.5	5.8
Northern Telecom Ltd	20	14	16.75	1.4	8.9
Novell Inc	38	20	32.125	-0.6	-1.9
Novell Corp	75	14	73.25	-0.1	-0.1
Pacific Telesis Group	38	28	37.125	-0.3	-0.7
Penril Corp	6	4	5.5	0.4	7.3
Plessey Plc	44	25	44.5	1.3	2.9
Scientific Atlanta Inc	16	10	14.625	-0.8	-4.9
Southwestern Bell Corp	48	34	47.875	1.4	3.0
3Com Corp	28	16	16.875	-1.6	-8.4
U.S. West Inc	64	51	63.875	0.3	0.4

Computer Systems

Alliant Computer Sys	8	3	4.375	0.1	2.9
Alpha Microsystems	8	5	7.25	0.5	7.4
Altos Computer Sys	10	9	6.5	0.5	7.7
AmDahl Corp	28	16	19	-0.3	-1.3
Apollon Computer Inc	17	7	12.875	0.0	0.0
Apple Computer Inc	48	34	30.75	-1.1	-2.8
Bolt Beranek & Newman	19	8	7.75	-0.6	-7.5
Britton Lee Inc	4	2	2.813	0.1	2.3
Compro Computer Corp	82	67	84	3.4	4.2
Computer Automation Inc	11	3	4.625	0.9	23.3
Concurrent Comp Corp	6	4	4.375	-0.1	-2.8
Control Data Corp	28	16	19.875	-1.6	-7.8
Convex Computer Corp	11	7	11	0.9	8.6
Cray Resh Inc	89	48	49.375	-7.3	-12.8
Daisy Sys Corp	12	4	4.5	0.1	2.3
Data Gen Corp	25	14	17.5	1.0	6.1
DataPoint Corp	6	4	3.875	0.4	10.7
Dell Computer Corp	29	7	7.875	0.0	0.0
Digital Equip Corp	122	85	95.5	-3.5	-3.5
Floating Point Sys Inc	4	2	2.75	-0.1	-4.3
Harris Corp	31	25	29.125	0.4	1.3
Hewlett Packard Co	84	44	56	-1.6	-2.2
IBM	131	106	114.5	2.1	1.9
Information Intl Inc	15	12	15	-0.3	-1.6
IPL Sys Inc	7	1	5.875	-0.3	-4.1
MAI Basic Four Inc	21	7	8	0.3	-8.0
Matsushita Elec Indol Ltd	219	160	174	-5.0	-2.8
Megadata Corp	3	1	1.313	-0.1	-8.7
Mentor Graphics Corp	38	23	37.25	-0.4	-1.0
MSI Inc	5	1	2.25	0.3	15.0
NCR Corp	70	51	55.875	-0.3	-0.4
Prime Computer Inc	21	12	19.125	-0.4	-1.9
Pyramid Technology	23	11	14.25	-0.5	-3.5
Silicon Graphics Corp	25	14	16.25	1.0	6.6
Stratus Computer	32	21	29.25	-0.6	-2.1
Sun Microsystems Inc	21	13	17	0.0	0.0
Symbios Inc	3	1	2	-0.3	-13.5
Sequent Computer Sys	28	14	26.25	-0.1	-0.5
Tandem Computers Inc	21	12	16.875	1.0	6.3
Tandy Corp	46	38	44.75	-0.5	-1.1
Ultimate Corp	15	11	9.625	-0.1	-1.3
Unisys Corp	38	25	28.75	-0.9	-3.3
Wang Labs Inc	12	7	7.75	-0.3	-3.1

Software & DP Services

Advanced Comp Tech	4	1	2.888	0.1	2.4
American Mount Sys Inc	19	12	14.125	-0.1	-0.9
American Software Inc	24	12	23.625	0.3	1.1
Anacom Inc	12	5	6	0.1	2.1
Analyst Intl Corp	19	8	18.75	0.5	2.7
Ashtek Inc	29	19	20.25	-0.8	-3.8
Ask Computer Sys Inc	18	12	15.25	0.1	0.8
Autodesk Inc	35	23	32.75	-0.8	-2.2
Auto Data Processing	42	35	38.125	-0.8	-1.9
BMC Software Inc	19	8	18.5	0.5	2.8
Boule & Babbage Inc	20	8	18.5	0.5	2.8
Businessland Inc	15	9	12.125	-0.4	-3.0
Computer Assoc Intl Inc	40	24	37.5	-1.3	-3.2
Computer Horizons Corp	12	7	8	0.0	0.0
Computer Systems Inc	96	13	52.5	1.8	3.4
Corporate Software	15	9	13	0.5	4.0
Computer Task Group Inc	17	10	13.875	-0.5	-3.5
Cosmos Inc	9	5	7.438	-0.2	-2.7
Comshare Inc	29	15	27.5	-1.5	-5.2
Cullinet Software Inc	9	4	5.375	0.5	10.3
General Mtrs (CLS)	46	37	48	0.9	1.9
Hogan Sys Inc	7	3	6.75	0.8	12.5
Informix Corp	25	7	11.375	0.0	0.0
Intell Corp Inc	4	2	4.25	0.4	9.7
Keane Inc	38	10	28.75	-4.8	-14.2
Legend Corp	24	18	24.625	1.1	4.8
Lotus Dev Corp	25	15	21.5	-1.0	-4.4
Management Sci Amer	14	6	10.875	0.6	6.1
Micro Pro Intl Corp	4	2	2.125	-0.1	-5.6
Microsoft Corp	71	48	54	-0.9	-1.6
National Data Corp	31	19	29.5	-0.9	-2.9
On Line Software Intl Inc	10	4	6.25	-0.3	-3.8
Oracle Sys Corp	29	15	27.75	0.3	0.9
Rasophic Sys Inc	17	12	16.375	0.5	3.1
Phoenix Technologies Inc	19	12	15	0.0	0.0
Policy Mgmt Sys Corp	9	21	25.875	-0.4	-1.4
Programming & Sys Inc	18	10	17.5	0.5	2.9
Rabbit Software Inc	3	2	1.888	-0.1	-3.5
Relational Technology Inc	21	10	11.375	1.3	12.3
Reynolds & Reynolds Co	31	17	30.75	0.3	0.8
Sei Corp	22	16	16.875	-0.1	-0.7
Shared Med Sys Corp	24	14	18.375	-0.4	-2.0
Sage Software Inc	10	6	8.125	-0.1	-1.5
Software Pkg Corp	27	15	23	-1.0	-4.2
Sterling Software Inc	9	5	5.5	-0.6	-10.2
Sungard Data Sys Inc	20	13	13.5	-0.5	-3.6

Systematics Inc	37	26	36.75	-0.3	-0.7
System Center Inc	11	12	19.875	-0.4	-1.9
Sys. Soft Inc	26	9	22.25	0.8	3.5

Semiconductors

Adv Micro Devices Inc	17	7	11.875	-0.1	-1.4
Analog Devices Inc	18	10	11.375	0.1	1.1
Analogic Corp	10	8	9.875	0.5	5.4
Chips & Technologies Inc	20	11	17.375	0.1	0.7
Intel Corp	37	19	28.25	-1.3	-4.2
LSI Logic Corp	14	8	11	-0.5	-4.3
Micro Technology Inc	28	15	19.5	0.3	1.3
Motorola Inc	55	36	48	-0.6	-1.3
Natl Semiconductor	15	7	8	0.1	1.5
Texas Instrs Inc	51	35	39.875	-1.4	-3.3
Western Digital Corp	17	11	11.875	-1.4	-10.4

Peripherals

Alloy Comp	4	2	2.063	-0.4	-17.5
Am Intl Inc	6	3	5.75	-0.1	-2.1
Asi Resh Inc	17	7	8.125	-0.4	-4.4
Auto Trol Tech Corp	6	4	4.75	-0.1	-1.3
BancTec Inc	14	8	12.375	-1.1	-8.3
Cher Data Prods Inc	18	9	7.125	-0.1	-0.7
Cognitronics Corp	5	2	3.875	-0.1	-3.1
Connex Peripherals	10	7	9.875	0.8	8.2
Data Products Corp	18	9	17.125	-0.1	-0.7
Dataram Corp	9	7	8.25	-0.4	-4.3
Eastman Kodak Co	50	40	47.375	0.0	0.0
Emc Corp Mass	10	3	3.75	0.3	7.1
Emulex Corp	12	6	10.875	0.0	0.0
Evans & Sutherland	20	13	18.5	0.3	1.4
ICOT Corp	4	2	2.5	-0.3	-9.1
Interleaf Inc	17	6	9.625	0.9	10.0
Iomega Corp	5	2	2.438	0.0	0.0
Lee Data Corp	7	2	7.125	0.1	2.3
Massstor Sys Corp	4	2	2.313	-0.1	-5.1
Maxtor Corp	16	6	10.125	-0.1	-1.2
Microplus Corp	25	6	6.625	0.0	0.0
Miniscribe Corp	14	3	3.75	-0.1	-3.2
Minnesota Mfg & Mfg Co	73	57	70.875	0.1	0.2
Personal Computer	7	4	4.625	0.2	4.2
Products Inc	2	1	0.75	0.1	9.0
Prism Corp	11	7	6.625	-0.1	-1.5
QMS Inc	11	6	8	-0.3	-3.0
Quantum Corp	19	10	18.125	0.1	0.7
Recognition Equip Inc	12	6	8.375	-0.1	-1.5
Rexon Inc	9	4	6.5	-0.1	-1.9
Seagate Technology	21	7	13.875	0.5	3.7
Storage Tech Corp	28	19	24.25	0.3	1.0
Tandon Corp	3	1	0.813	-0.1	-7.1
Tektronix Inc	27	19	22.5	0.5	2.3
Televideo Sys Inc	1	0	0.344	0.0	0.0
Xerox Corp	88	50	67.625	3.0	4.6

Leasing Companies

Amplicon Inc	115	13	15.375	-0.9	-5.4
Capital Associates Inter-National Inc	9	4	8.125	0.4	4.8
Comdisco Inc	26	19	24.25	0.3	1.0
Continental Info Sys	8	0	0.75	-0.1	-14.3
LDI Corporation	17	10	15	-0.8	-4.8
Phoenix Sys Inc	3	3	2.625	-0.1	-3.8
Selecterm Inc	9	4	8.438	-0.3	-3.6

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Future faith

While IBM shareholders score big, others are less lucky

IBM's faith in its own future made its inspirational point last week. The company declared its first dividend increase in 4½ years. IBM stock closed Thursday at 114½, up 1½ points.

Elsewhere in the tech market last week, inspiration seemed in short supply. Desperation, perhaps: Cray Research, Inc.'s quarterly earnings dropped 94%, taking its stock down 6¼ points. Cray closed Thursday at 49½. Digital Equipment Corp. lost most of the ground it gained earlier from a positive midmonth earnings report. DEC stock slipped 1½ points to a Thursday close at 96¼. Prime Computer, Inc. announced a first-quarter net loss of \$5 million on revenue of \$387 million, a 6% increase over last year's comparable period. Prime attributed both the loss and the scant gain to the high cost of fighting off MAI Basic Four, Inc.'s hostile takeover attempt. The cost to Prime stock, which closed at 19½, was ¾ of a point.

Meanwhile, takeover rumors did nothing to hurt Cullinet Software, Inc. and Seagate Technology, Inc. Cullinet closed Thursday at 5½, up ½ of a point; Seagate ended the week at 14¼, up 1½ points.

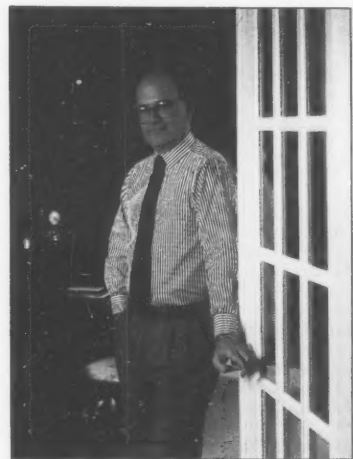
NELL MARGOLIS

Cullinet's life on the fault line

BY NELL MARGOLIS
CW STAFF

WESTWOOD, Mass. — A year ago when Cullinet Software, Inc. capped a two-year-long product-line repositioning with a massive corporate reorganization, the software industry pioneer was charged with the challenge of pulling out front again.

On the anniversary of the debut of the "new Cullinet," the company is at the crossroads once again. But this time, the challenge is staying alive.



Cullinet's Weiler combats users' doubts

Cullinet, once a virtual one-product player locked into a mature market, has spent the last year trying to transform itself into a multiproduct player across a variety of platforms. Today, the product turnaround that many suspected could not be done is a done deal. However, it may have been accomplished at too high a cost.

According to several of its most senior executives, Cullinet underestimated two critical factors: the sheer cost of the corporate reincarnation and the possibility that sales of older product lines would slow down faster than sales of new lines would gear up. As a result, the return to profits promised many quar-

ters ago has yet to materialize.

For users, there is particular irony in the possibility that their vendor has achieved a technologically alluring product array at the possible cost of its corporate existence.

"The dilemma here is obviously the [dynamics of] the transition," said Cullinet Executive Vice-President John B. Landry III. Cullinet is not alone — Unisys Corp. and IBM are prominent companies attributing recent setbacks to massive product line transitions. Thus, few have doubted that Landry has targeted the right problem. The question seems to be this: Which will run out first, Cullinet's money problems or Cullinet's money?

"The No. 1 issue," said company founder and Chief Executive Officer John J. Cullinane, "is cash — preservation of cash."

Company executives and industry analysts alike, however, noted a vicious-circle effect that grows with each passing profitless

quarter. Cullinet's failure to leverage its second-quarter 1989 operating profit into a third-quarter net profit "probably cost the company around \$10 million in terms of revenue that would have shown up in the fourth quarter," said Charlotte Walker, an analyst with County Natwest USA in New York.

Senior executives with whom Walker spoke last week confirmed that up to \$8 million that did not materialize because prospective customers grew leery of signing on with a shaky firm, she said.

These days, the uncertainty includes the possibility that Cullinet will no longer be an independent firm by the time the cus-

tomers' bill arrives. A spate of buyout rumors was sparked by Cullinet's recent hiring of investment banking firm Goldman, Sachs & Co. to explore opportunities to get an infusion of the funds the firm so badly needs. Those rumors have served to worsen the skittishness already plaguing potential Cullinet customers.

"A lot of people have said to me, 'I'd buy your products in a minute if I could be sure you weren't being bought,'" said President Robert K. Weiler. "As it is, they say, 'We'll wait and see how you do.' The trouble is, when customers wait and see how you do, you don't do as well."

True loyalty

For the meantime, at least, Cullinet's reputation for commanding loyalty from its users appeared solidly intact.

"We still back Cullinet," said Richard Lenz, database administrator at Wisconsin Gas Co. in Milwaukee. Lenz declared his company, a gas utility serving some 500,000 customers, "happy with IDMS/R and ADS On-Line; we're not aware of any other database that will give us the performance that we require."

Nor is Lenz' satisfaction tied to protecting an investment already made. "I can see us buying the [Cullinet] Enterprise Generator for the mainframe," he said. "In fact, I've recommended that purchase to our management."

Wisconsin Gas, Lenz said, is discomfited by its supplier's problems of the purse. "We want to see IDMS/R enhanced," he said, "and Cullinet's financial status affects that." However, he said, discomfited and defection are two different matters. "As long as IDMS/R is even minimally supported, as long as what's broken gets fixed, we'll stay with Cullinet," he said.

At Exchange National Bank in Chicago, a beta-test site and early buyer of Cullinet's banking software system, Senior Vice-President of Information Services Jerry Peters admitted, "I'm a little more concerned



Cullinet's CEO John Cullinane says the No. 1 issue is the preservation of cash

about Cullinet's financial situation than I was a year ago."

However, he added, careful evaluation of the problem, including a number of talks with financial analysts, has convinced him that "for us, the most advisable course is sticking with Cullinet. I think they're going to make it. And I'm very convinced and increasingly reassured that their software for the banking industry is the best there is."

Sam Schneider, MIS director at Lifeline Systems, Inc. in Waverly, Mass., said that Cullinet's financial worries and the newness of its VAX-based tools made him doubt that Lifeline would choose to sign on as a customer. After months of evaluating leading competitors' offerings, however, "we found compelling technological reasons to go with Cullinet," he said.

Retooling to survive

After a slow but nonetheless rude awakening to the fact that IBM's DB2 had taken over the mainframe database management system market, Cullinet has sought to recast itself as a tools vendor for multiple hardware platforms.

For the company that once relied almost solely on mainframe DBMS revenue, diversification has been a necessary step for the firm's survival. Although its new DBMS and tools for the Digital Equipment Corp. VAX have won praise, that may not be enough to reverse Cullinet's fortunes.

Cullinet is betting its future on a strategy it calls Enterprise Computing, building on its previous three-by-three strategy — integrating database, tools and applications across corporate, departmental and personal computer platforms. The emphasis is on cooperative processing among workstations and hosts in a client-server model. Products compliant with this strategy have been designated with the prefix Enterprise.

The cornerstone of this strategy is the development technology contained in Cullinet's Enterprise:Generator, which allows high-level specifications to be created on one platform and generated on others.

Once a proprietary vendor, Cullinet has embraced standards and has vowed to support other major DBMS offerings such as DEC's RDB and Oracle Corp.'s Oracle DBMS.

Cullinet planned to enter its most unfamiliar territory yet with the Enterprise DBMS and tools for Unix systems — an area alien to most of its customer base. Although that development has been completed — even delivered to at least one military customer, according to the firm — Cullinet has pushed back the scheduled introduction by a year.

"We decided not to commercialize the Unix database until the tools are ready for the Unix platform, and we can make the launch with all our ducks in a row," said Marketing Vice-President Jeffrey Papows.

Cullinet plans to port the Enterprise DBMS and generator to the IBM mainframe while continuing to support the large installed base of IDMS/R customers. The older IDMS/R will be positioned as the high-performance, non-SQL DBMS, according to the firm.

Enterprise development tools for PCs running MS-DOS were introduced as scheduled earlier this year, designed to create cooperative processing applications. Although OS/2 is a direction for Cullinet, there is no date set for products.

AMY CORTESE

Second-class postage paid at Framingham, Mass., and additional mailing offices.

Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January of 1989 by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.

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Computerworld can be purchased on 35 mm microfilm through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, Mich. 48106. Computerworld is indexed: back issues, if available, may be purchased at \$2.00 per issue, plus postage. Call (800) 669-1002.

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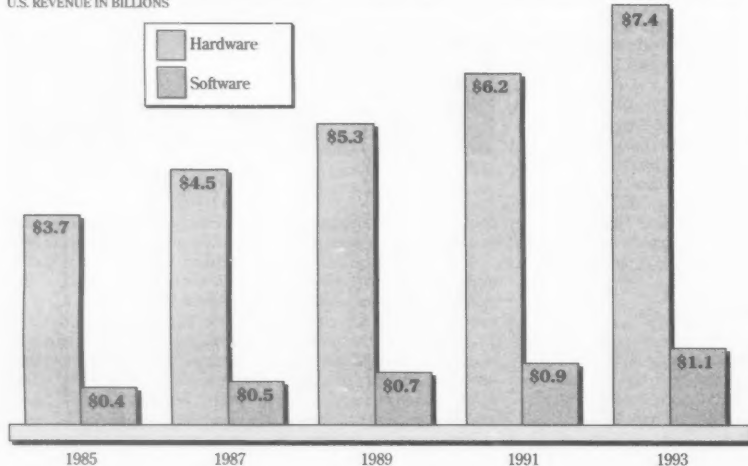
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TRENDS

Computers in banking

Hardware and automation software both grow steadily

U.S. REVENUE IN BILLIONS



Behind the screen of the local automated teller machine lurks a bundle of bills ready to pour into your hand at the touch of a few buttons. Back there also beats the heart of a big business for banks: automation. And banks are cashing in on it.

As competition builds from nontraditional firms offering financial services, banks and other institutions are turning their attention toward technology for competitive advantage. This year they will spend some \$6 billion on information systems and software, according to Market Intelligence Research Co. in Mountain View, Calif.

Hardware dollars more often buy smaller systems, particularly microcomputers. Likewise, distribution of automation software has come to favor downsizing.

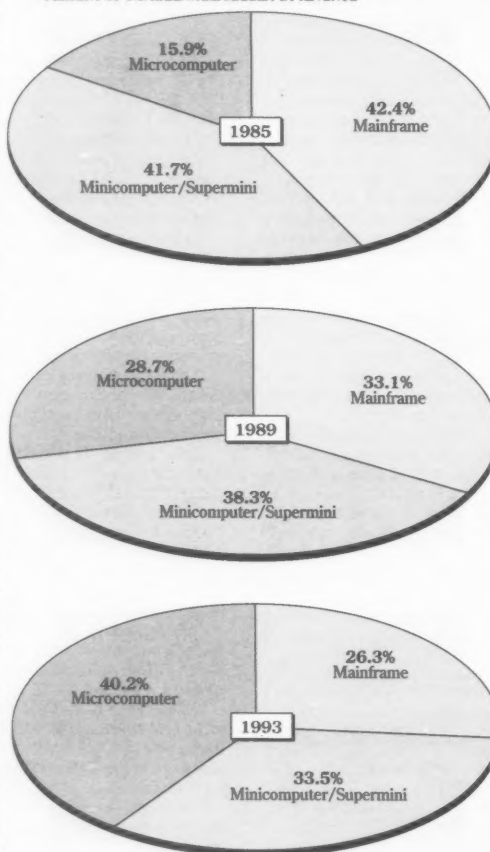
Until 1986, mainframes were the hardware platform of choice; then minis took center stage. Personal computers also picked up slack from mainframes, but they have made little progress overall. PC software should account for about 6% of revenues this year and gain only 1% during the next five years, according to Market Intelligence.

The research house breaks down banking automation software into six types: deposit, credit/loan, operations processing and administrative management, electronic funds transfer, investment/trust and integrated software. Among these, it predicts substantial revenue growth only for integrated software.

LAURA O'CONNELL

Emphasis on downsizing

PERCENT OF U.S. HARDWARE MARKET BY REVENUE



SOURCE: MARKET INTELLIGENCE RESEARCH CO.

CW CHARTS: FRANK C. O'CONNELL

INSIDE LINES

Office May Day. May 16. It's a Tuesday — IBM's favorite product announcement day. It follows a period during which the company has been hinting broadly that its first fully SAA-compliant application is coming. Yes, more and more developers and consultants are saying that May 16 is the day IBM will announce "SAA Office." If all goes according to form, IBM will have a room full of third-party vendors all demonstrating applications that already work with the much-anticipated product. You'll have to stay tuned to see when it will actually ship.

Twice as nice. Stellar Computer is slated today to introduce its next generation of graphics supercomputers that will reportedly feature the industry's first dual-user system. The product line will consist of four models and offer roughly twice the performance of the current line, the GS1000, at approximately the same price, a Stellar spokeswoman said. That means the new systems will log in at 40 MIPS for around \$100,000. However, the new line won't cancel out the GS1000, which recently had a price cut to correspond with this week's announcement. The older systems now have starting prices of \$90,000. Stellar plans to play up the departmental role for graphics supercomputers and will announce networking software as well.

Good news for a change? Financial losses aside, Wang users can look forward to a healthy slate of product rollouts in the coming months, a source close to Wang said. Kicking off Wang's new emphasis on its imaging technology, the firm will offer a version of its imaging software that will run on any industry-standard personal computer, possibly at the AIM show in June. In addition, the source said Wang will unwrap a new midrange family, calling it "a completely revamped line." Deep Throat also said that users can expect higher performance Intel 80386 and 486 boxes toward the end of the calendar year. Asked to comment, a Wang spokesman said, "They all sound like smart moves, but I can't comment. But those do have a nice ring to them."

PCs as Post-It pad poles. "What's normal is what's natural" — at least in terms of how users interact with systems, said Fred Schott, senior consultant at Aetna Life's Technology Services. After spending megabucks on facilities such as its Usability Laboratory, Aetna has plenty of proof that the menus, icons or commands that work for one user or set of users can drive another type of user to distraction. So they bring users into the design process and check work areas for telltale signs of user frustration — like little pieces of paper stuck all over terminals.

When is a bug a virus? Computer scientists at Nova University in Fort Lauderdale, Fla., say that if you are running one of an estimated 25 million PCs that use the 8272A floppy disk controller made by Intel and NEC Electronics, then your data is at risk. The researchers said that the microchip contains a hardware-induced virus that can corrupt data or cause it to be lost when writing to a floppy. Researchers add that this virus can propagate and infect other databases. Intel spokeswoman Kristine Bailey says that it is a hardware bug, not a virus, and that the problem was detected and fixed last year. Bailey adds that while the problem could "theoretically happen," the possibility is extremely remote. She would not disclose the number of chips that were sold before the bug was squashed but says that computer scientists at Nova overestimate the problem.

Pushing the speed limit. DCA updated analysts on a product important to its long-term health, a new platform designed to facilitate LAN-to-WAN integration. Advanced Communications is said to be a modular, software-intensive fast-packet switch that will support up to eight LAN-to-WAN links. The product line is based on Advanced Micro Devices' AMD 2900 reduced instruction set computing chip and will feature Fiber Distributed Data Interface capabilities. A September introduction at the TCA show is likely.

We'll leave the spills to Exxon in favor of a few leaks. Got some info? Buzz our hot line modem at 508-626-0214, -0235 or -0165. Or use your speech synthesizer and call Assistant News Editor Jim Connolly at 1-800-343-6474.

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